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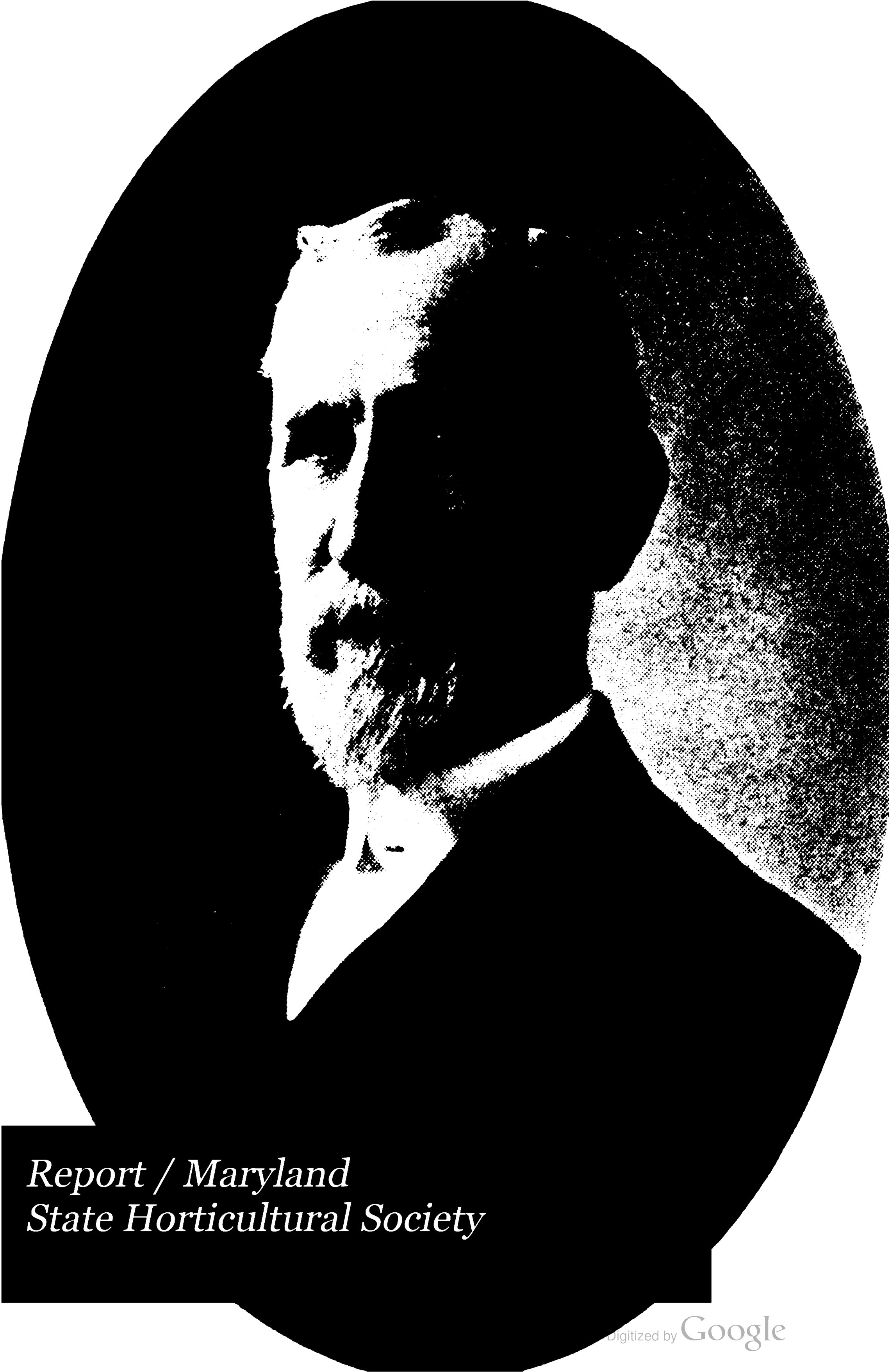

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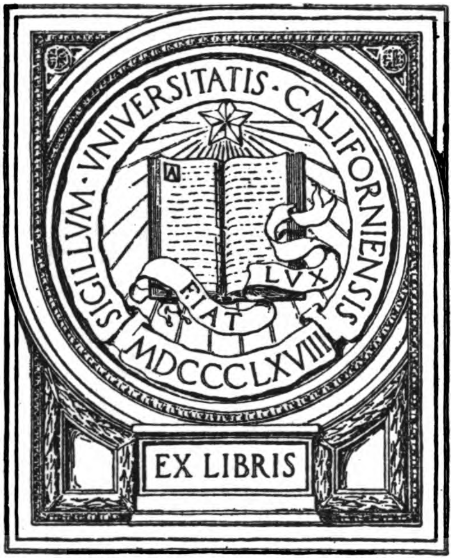

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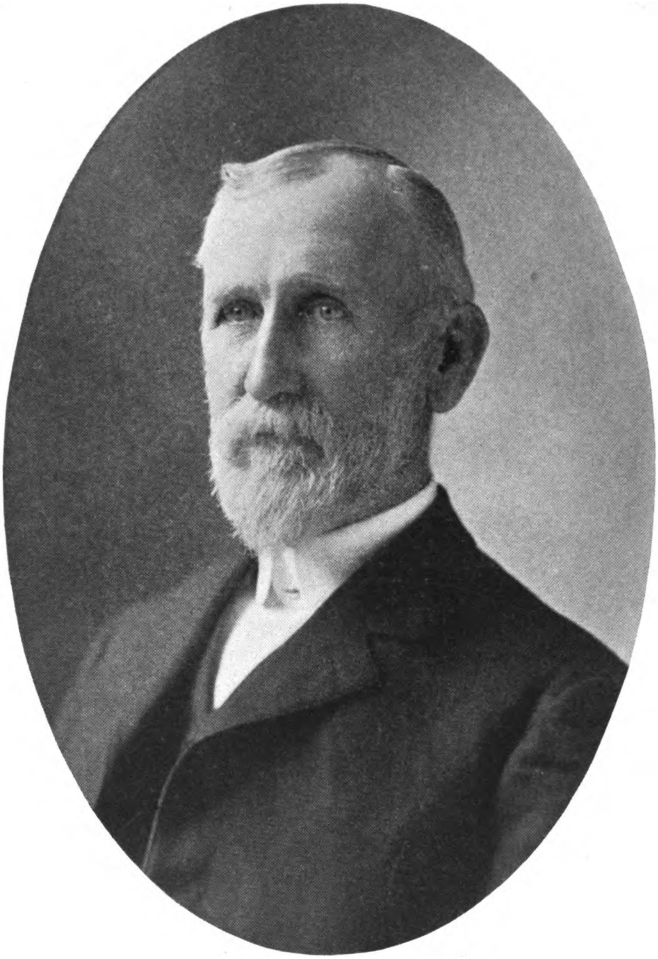

J. N. Kerr

REPORT

OF THE

Maryland State Horticultural Society

SIXTH ANNUAL MEETING

HELD IN BALTIMORE [illegible]

JONATHAN WILLIAMS KERR,

OF CAROLINE COUNTY, MARYLAND, PRESIDENT OF THE MARYLAND STATE HORTICULTURAL SOCIETY DURING 1903.

For many years a leader in Maryland horticulture and one of the strongest supporters of its horticultural societies, and a promoter of the advance of horticultural knowledge of the highest type. Forty-seven years of his life have been devoted to the study and growing of fruits and the propagation of nursery stock. His horticultural knowledge has come from practical experience. Not satisfied with second-hand knowledge he has collected and tested a vast number of varieties, ninety per cent of which were proved to be failures. Mr. Kerr's nursery and trial orchards, especially his unsurpassed collection of plums, and above all his delightful Eastern Shore home at Denton have long been a resort for many friends professionally engaged in the advancement of horticulture.

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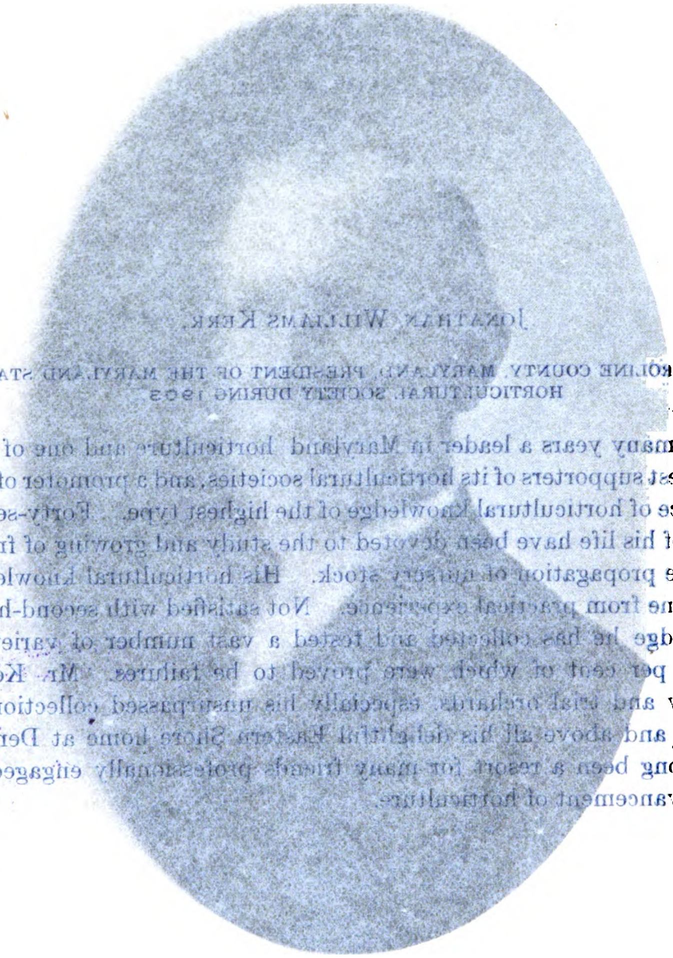
FOR THE YEAR 1903.

Published by the Society.   Edited by J. B. S. Norton, Secretary.



J. W. Kerr

Taylor

REPORT

OF THE

Maryland State Horticultural Society

SIXTH ANNUAL MEETING

HELD IN BALTIMORE, JANUARY 14-15, 1904.

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VOLUME VI,

FOR THE YEAR 1903.

Published by the Society. **Edited by J. B. S. NORTON, Secretary**

Letter of Transmittal.

To Hon. Edwin Warfield, Governor of the State of Maryland:

SIR:—I respectfully transmit to you as directed by the Act incorporating the Maryland State Horticultural Society, this report for the year 1903, which contains a detailed statement of the receipts and expenditures of the Society as approved by the Executive Board, and the transactions of the Sixth Annual Meeting, with the addresses, discussions and reports there presented for the promotion of the horticultural interests of the State of Maryland.

J. B. S. NORTON,
Secretary-Treasurer.

College Park, Md.

17c54

Officers for 1904.

EXECUTIVE BOARD.

President—Mr. A. L. Towson	Smithsburg.
Vice-President—Mr. W. F. Allen	Salisbury.
Secretary-Treasurer—Prof. J. B. S. Norton	College Park.
President Western Maryland Society—Mr. Chas. G. Biggs	Sharpsburg.
Vice-President Peninsula Society—Mr. Jerome A. Davis	Greensboro.

COUNTY VICE-PRESIDENTS.

Allegany, Mr. Frank B. Reid	Cumberland.
Anne Arundel, Mr. J. S. Linthicum	Wellhams.
Baltimore, Mr. Richard Vincent, Jr.,	White Marsh.
Caroline, Mr. Jerome A. Davis	Greensboro.
Calvert, Mr. Frank O. Smith	Dunkirk.
Cecil, Mr. Geo. Balderston	Colora.
Charles, Mr. W. W. Cobey	Grayton.
Carroll, Mr. Jesse Smith	Union Bridge.
Dorchester, Mr. W. G. Dawson	Cambridge.
Frederick, Mr. S. M. Birely	Frederick.
Garrett, Mr. W. McCulloh Brown	Oakland.
Howard, Col. W. S. Powell	Annapolis Junction.
Harford, Mr. Louis Hollingsworth	Forest Hill.
Kent, Mr. Frank P. Cochran	Galena.
Montgomery, Mr. Asa M. Stabler	Spencerville.
Prince George's, Dr. E. P. Magruder	Glendale.
Queen Anne, Mr. W. Irving Walker	(Millington).
St. Mary's, Mr. Jesse Turner	Laurel Grove.
Somerset, Mr. F. E. Matthews	(Pocomoke).
Talbot, Dr. Chas. Lowndes	Easton.
Worcester, Mr. Orlando Harrison	Berlin.
Wicomico, Mr. Jefferson Stayton	Salisbury.
Washington, Mr. E. P. Cohill	Hancock.

Standing Committees.

APPOINTED BY THE PRESIDENT.

Orchards.
Mr. E. P. Cohill,
Prof. C. F. Austin,
Dr. W. S. Maxwell.

Vineyards.
Mr. S. B. Loose.

Stone Fruits.
Mr. James S. Harris.
Dr. E. P. Magruder.

Small Fruits.
Mr. J. W. Kerr.
Mr. J. S. Linthicum.

Vegetables.
Dr. E. J. Dirickson.
Mr. Richard Vincent, Jr.

Flowers.
Mr. Henry Holtzapfel.
Mr. Henry Weber, Jr.

Ornamentals.
Mr. Jos. A. Davis.
Mr. Chas. E. Seybold.

Entomology and Ornithology.
Prof. T. B. Symons.

Botany and Plant Pathology.
Prof. J. B. S. Norton.

Nomenclature and New Fruits.
Mr. H. P. Gould.

Packing and Marketing of Fruit.
Mr. W. F. Allen.
Mr. Caleb Long.

Transportation.
Mr. W. G. Dawson.
Mr. Guy L. Stewart

Orchard Fertilizers.
Director H. J. Patterson.

Membership.

Life Members.

W. G. Johnson	New York, N. Y.

Honorary Members.

Prof. L. H. Bailey	Cornell University, Ithaca, N. Y.
Dr. John J. Black	New Castle, Del.
J. H. Hale	South Glastonbury, Conn.
Roland Morrill	Benton Harbor, Mich.
Wm. A. Taylor	Department of Agriculture, Washington, D. C.
M. B. Waite	Department of Agriculture, Washington, D. C.
H. E. Van Deman	Washington, D. C.
Prof. F. A. Waugh	Massachusetts Agricultural College, Amherst, Mass.
Dr. H. J. Webber	Department of Agriculture, Washington, D. C.

The regular membership consists of 2,593 members distributed as follows:

Allegany, 30.
Anne Arundel, 123.
Baltimore, 135.
Baltimore City, 246.
Calvert, 39.
Caroline, 137.
Carroll, 122.
Cecil, 68.
Charles, 53.
Dorchester, 110.
Frederick, 171.
Garrett, 68.
Harford, 66.
Howard, 39.
Kent, 162.
Montgomery, 79.
Prince George's, 116.
Queen Anne, 51.
St. Mary's, 45.
Somerset, 30.
Talbot, 78.
Washington, 433.
Wicomico, 27.
Worcester, 48.
Outside the State, 117.

The Maryland State Horticultural Society.

FOUNDED 1898. **INCORPORATED 1900.**

ACT OF INCORPORATION.

AN ACT to incorporate the Maryland State Horticultural Society and to appropriate a sum of money therefor.

Section 1. BE IT ENACTED BY THE GENERAL ASSEMBLY OF MARYLAND, That the members of the Maryland State Horticultural Society be and they are hereby incorporated under the name and style of "The Maryland State Horticultural Society," and by that name shall have perpetual succession, sue and be sued, plead and be impleaded in any court of law or equity whatsoever, and may have and use a common seal, and the same alter at pleasure.

Sec. 2. The affairs of the corporation shall be managed by an executive board, consisting of the president, first vice-president and secretary of the society, the president of the Western Maryland Horticultural Society, and the president or first vice-president, representing the State of Maryland, as the case may be, of the Peninsula Horticultural Society, and that said officers now elect shall be the first members of the executive board created by this Act, and shall hold their offices until their successors are duly elected in conformity with the respective constitutions of the said societies.

Sec. 3. The said executive board shall have sole care and disposal of all funds appropriated by the Legislature of Maryland for the Maryland State Horticultural Society, and shall expend the same in such a manner as will, in their judgment, best promote the development of the horticultural interests of the State of Maryland. They shall render annually to the Governor of the State a detailed statement of all funds received from the State and all other sources, and also of all expenditures made by them and the specific objects for which said sums were expended. They shall make no appropriation unless they have funds on hand to meet the same. The members of the said board shall be jointly and severally liable for the payment of any debt created by the board in the absence of funds in the treasury to meet such obligation; nor in any event shall a debt be contracted except by the concurrent vote of the members of said board, which number shall constitute a quorum for the transaction of business.

Sec. 4. The executive board shall, through the secretary of the society, render to the Governor of the State an annual report of its transactions, published at the expense of the society, which publication shall include the annual reports of the State Entomologist and State Pathologist, together with such other papers as said board shall deem of value to horticulture and its allied branches.

Sec. 5. The Maryland State Horticultural Society shall have power to adopt and enforce any by-laws and rules not in conflict with the Constitution and laws of this State.

Sec. 6. For the purpose of carrying out the provisions of this Act, and to aid in the development and conservation of horticulture in Maryland, the sum of one thousand dollars is hereby appropriated, and the same amount annually thereafter; and the Comptroller of the Treasury is hereby authorized and directed to issue his warrant annually upon the State Treasurer for the said sum of one thousand dollars, to be paid out of any funds in the Treasury not otherwise appropriated, to the treasurer of the Maryland State Horticultural Society, who shall give bond in double the amount of the fund he is expected to handle, executed to the said society, with two or more sureties, or secured by a trust or surety company, qualifying before a notary public as to their sufficiency as bondsman or surety, the said society shall pay the cost of obtaining this security.

Sec. 7. The first annual payment of one thousand dollars shall be made to the treasurer of the society during the first fiscal year ending September 30, 1900, and annually thereafter on or before the first day of October in each year.

Sec. 8. This Act shall take effect from the date of its passage.

Approved April 5, 1900.

Constitution and By-Laws.

CONSTITUTION.

Revised at Fourth Annual Meeting.

ARTICLE I. This Association shall be known as The Maryland State Horticultural Society. Its object shall be the promotion of horticulture in all its branches.

ARTICLE II. Any person may become a member of this Society by signing the roll of the Society, or by presenting his or her name to the Secretary, who is thereupon authorized to add the name of said applicant to the roll of the Society.

ARTICLE III. The officers of this Society shall consist of a President, Vice-President and a Vice-President from each County in the State, and a Secretary-Treasurer, who shall be elected by ballot at each regular December meeting, and whose term of office shall begin on the first day of January following their election.

ARTICLE IV. The executive officers of this Soceity shall constitute an executive committee, at any meeting of which a majority of the members shall have power to transact business. The other duties of the officers shall be such as usually pertain to the same officers of similar organizations.

ARTICLE V. The regular meetings of this Society shall be held beginning the first Wednesday in December, except when otherwise ordered by the Executive Committee.

ARTICLE VI. As soon after each regular annual meeting as possible, the President shall appoint the following standing committees and they shall be required to give a report in writing, under their respective heads, at the annual meetings of the Society, of what transpired during the year of interest to the Society: orchards, vineyards, stone fruits, small fruits, vegetables, flowers, ornamentals, entomology, ornithology, botany, plant pathology, nomenclature, new fruits, packing, storing and marketing fruits and transportation.

ARTICLE VII. The Treasurer shall give bond in twice the sum he is expected to handle, executed in trust to the President of this Society (forfeiture to be to this Society) with two or more sureties or a trust and surety company, qualifying before a notary public of their qualifications as bondsmen, as is provided by the statute concerning securities, and this Society shall pay the cost of obtaining this insurance or surety.

ARTICLE VIII. This Constitution may be amended by a two-thirds vote of the members present at any regular meeting, notice having been given at a previous meeting.

BY-LAWS.

Adopted at Third Annual Meeting.

SECTION 1. The President's duties shall be: 1. To preside at all meetings of the Society. 2. To deliver an address upon a horticultural subject of his own selection at each Annual Meeting. 3. To call meetings of the Executive Committee, and, with its concurrence, have superintendence of the affairs of the Society in the interim between its meetings. 4. To appoint all select committees, unless the Society shall otherwise direct.

SEC. 2. In the absence of the President, the Vice-President shall preside at all meetings; in the absence of both, the Society shall elect a temporary presiding officer. The Vice-President shall also perform the duties of the President during the recess of the Society in the event of the disqualification of the latter for the performance of the functions of his office.

SEC. 3. It shall be the duties of the Vice-Presidents for the various Counties of the State to encourage and promote the formation of local societies, tributary to this Society; to obtain accurate information upon all horticultural subjects of general interest in their respective Counties, and report fully in writing thereupon at the succeeding Annual Meeting of this Society.

SEC. 4. The Secretary shall record the Proceedings of the Society, file and preserve all its documents, prepare all reports for publication, attend to the correspondence of the Society, and perform such other duties as naturally pertain to his office.

SEC. 5. The Treasurer shall receive all moneys payable to the Society, and keep an accurate account of the same, disbursing such funds only upon the order of the Executive Committee. He shall submit at each Annual Meeting a written report of all the receipts and disbursements, the latter to be supported by sufficient vouchers, which, with his report, shall be referred to a special auditing committee, who shall report thereupon at the same meeting. He shall pay all funds and deliver all property of the Society in his possession to his successor in office as soon as the latter shall have qualified. He shall also keep a roll of the membership.

SEC. 6. In addition to the duties prescribed by the Constitution, the Executive Committee may call special meetings of the Society at such times and places as they may determine, after publication to that effect in such newspapers of this State as they may select, and notification by mail of all the Vice-Presidents for the Counties, thirty days prior to the date of such meetings.

SEC. 7. The term of each elected officer shall begin on the first day of January next succeeding his election, but all such officers shall hold their offices until the election and qualification of their successors.

SEC. 8. All persons interested in horticulture, or allied pursuits, shall be admitted to membership upon making application therefor. No person not a member shall be permitted to vote or to participate in discussion upon the floor, except by invitation of the Executive Committee, or consent of the Society. Application for membership shall be made to the Treasurer, who shall place the name of the applicant upon the roll of the Society.

SEC. 9. Each member shall be entitled to a copy of the published reports of the Society.

SEC. 10. The regular order of business at each meeting shall be:

1. Organization.
2. Secretary's Announcements.
3. Report of the Treasurer.
4. Reports of Standing Committees.
5. Special Committees.
6. Address by the President.
7. Papers, Addresses and Discussions.
8. Reports of Select Committees.
9. General Business.
10. Adjournment.

SEC. 11. These By-Laws may be amended by a two-thirds vote of the members present at any Annual Meeting, or at any meeting called for that purpose.

REPORT

OF THE

SIXTH ANNUAL MEETING.

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The discussions of each subject follow the same.

Transactions.

FIRST SESSION.

Thursday afternoon, January 14.

The Sixth Annual Meeting opened in Dushane Post Hall, Baltimore, 1:30 P. M., January 14, 1904. There were about 225 persons in attendance at the various sessions. Those who registered were distributed in the State as follows: Anne Arundel Co., 10; Baltimore City, 51; Baltimore Co., 34; Calvert Co., 1; Caroline Co., 7; Carroll Co., 6; Cecil Co., 1; Charles Co., 2; Dorchester Co., 1; Frederick Co., 2; Garrett Co., 1; Harford Co., 10; Howard Co., 1; Montgomery Co., 6; Prince George's Co., 21; St. Mary's Co., 1; Somerset Co., 1; Talbot Co., 2; Washington Co., 10; Worcester Co., 4; other States and D. C., 20.

President J. W. Kerr opened the meeting and presided at all the sessions.

After the opening announcements by the President, the Secretary-Treasurer made his reports (page 17). On motion of President R. W. Silvester, the Treasurer's report was referred to an auditing committee for examination and report to the Society.

President Silvester was called upon to give the report (p. 98) of the committee appointed at the previous annual meeting to consider the matter of a fruit exchange in Baltimore. He reported progress and asked that the full report be deferred to another year. On motion the committee was granted further time.

Vice-President Geo. O. Brown was called upon and gave a report (p. 19) of the summer meeting of the Society with Mr. W. F. Allen at Salisbury.

The chair appointed Mr. Wm. A. Taylor and Prof. C. F. Austin a committee on nomenclature to examine the products on exhibition.

The question of securing reduced postal rates for the annual report was discussed, and on motion of Col. W. S. Powell, referred to the Executive Board.

Colonel Powell was called upon by the chair and gave a report (p. 35) on horticulture in Howard County. The report was discussed by President Kerr and President Silvester.

The President delivered his annual address (p. 122).

Prof. W. F. Massey, Horticulturist of the North Carolina Experiment Station, addressed the Society on the Growth of Market Gardening in the South and its interest to Maryland (p. 125). The address was discussed by Dr. B. von Herff and Mr. J. P. Blessing.

Mr. Wm. A. Taylor, of the U. S. Department of Agriculture, was called upon and spoke of the Department's work in pomology (p. 138).

Mr. Richard Vincent, Jr., presented the report (p. 63) of the Committee on Vegetables.

Prof. T. B. Symons gave his report as State Entomologist (p. 98) and that of the Committee on Entomology (p. 65). The reports were discussed by Mr. Geo. Balderston, President Silvester, Mr. S. S. Stauffer, Mr. J. P. Blessing, Mr. F. C. Ramsdel, Dr. von Herff, Prof. J. B. S. Norton, Mr. Dickson, Mr. A. N. Brown and Mr. A. L. Towson.

The chair appointed Messrs. J. P. Blessing, F. C. Ramsdel and Dr. E. P. Magruder a committee to examine and report on a bill to establish a State Board of Forestry, which was submitted by Mr. Balderston.

The secretary announced the special invitation to ladies to attend the evening session and that there would be a demonstration of the making of the lime, sulphur and salt wash and Bordeaux mixture before the meeting the following morning.

The Society adjourned until 8.00 o'clock P. M.

SECOND SESSION.

Thursday Evening, January 14.

The second session convened at 8.00 o'clock P. M.

Questions from the question box were discussed by Mr. Frederick H. Blodgett, Mr. A. N. Brown and Mr. C. R. Hartshorn (page 170).

Dr. H. J. Webber of the Laboratory of Plant Breeding, United States Department of Agriculture, gave an address (page 140) on Plant Breeding, illustrated by lantern slides.

Mr. Orlando Harrison read the report (page 86) of the Committee on Nomenclature and New Fruits. It was discussed by A. L. Towson, J. P. Blessing and J. A. Davis.

Mr. Chas. L. Seybold, Superintendent of Patterson Park, read a paper (page 142) on Ornamental Plants for Home Grounds.

The chair appointed as a committee to audit the Treasurer's accounts, Messrs. Chas. G. Biggs, C. M. Peters and Geo. Balderston.

Mr. E. A. Seidewitz gave the report (page 63) of the Committee on Ornamentals.

Other questions (page 173) from the question box were taken up and discussed by Messrs. J. A. Davis, A. N. Brown, B. von Herff, Geo. O. Brown, R. W. Silvester, J. B. S. Norton and J. P. Blessing.

The chair appointed a committee consisting of Dr. E. P. Magruder, Messrs. A. L. Towson and Chas. E. Seybold to nominate officers for the coming year.

The report (page 179) of the auditing committee was presented by Mr. Biggs, and on motion was adopted.

The Society adjourned to 9:00 A. M. the following day.

THIRD SESSION.

Friday Morning, January 15.

The Society met at 9:00 A. M.

The chair announced the appointment of Mr. E. P. Cohill in place of Mr. Towson on the nominating committee.

Questions (page 174) from the question box were discussed by Mr. Orlando Harrison and Dr. von Herff.

The report (page 48) of the Committee on Orchards was made by Mr. A. L. Towson.

Mr. Jerome A. Davis gave his report (page 26) as Vice-President for Caroline County. The report was discussed by Messrs. Brown, Kerr, Towson and Vincent.

Mr. Vincent reported as Vice-President for Baltimore County. The report (page 22) was discussed by Dr. von Herff, Mr. Biggs and Mr. Davis.

The Secretary read the report (page 25) of Frank O. Smith, Vice-President for Calvert County. It was discussed by President Silvester.

Mr. Balderston reported as Vice-President for Cecil County (page 30).

F. A. Waugh, Professor of Horticulture in the Massachusetts Agricultural College, addressed the Society on The Tree Planter's interest in Propagation (page 152). The address was discussed by Messrs. Cohill, Hartshorn, Towson, Davis, Miller, Kerr and Harrison.

Mr. A. N. Brown presented the report (page 181) of the Committee on Awards.

Mr. J. P. Blessing read the report of the Committee on the Bureau of Forestry bill (page 177). On motion of Mr. Biggs the report was adopted, and the bill endorsed by the Society.

On motion the report of the Committee on Awards was adopted.

H. J. Patterson, Director of the Maryland Experiment Station, delivered the report (page 94) of the Standing Committee on Fertilizers.

The report (page 49) of the Committee on Stone Fruits was presented by Dr. E. P. Magruder.

The Society adjourned until 2:00 P. M.

FOURTH SESSION.

Friday Afternoon, January 15.

The Society met at 2:00 P. M.

Questions from the question box (page 174) were discussed by Mr. H. L. Shipley, Professor Austin, Messrs. Orlando Harrison and M. B. Waite.

The chair appointed Messrs. H. R. Fuss, C. R. Hartshorn and E. A. Seidewitz a committee on resolutions.

Mr. W. L. Amoss addressed the Society on Maryland Horticulture at the Louisiana Purchase Exposition (page 147). The subject was discussed by Messrs. Silvester, Hartshorn, Geo. O. Brown and E. A. Seidewitz.

On motion of President Silvester, the Society voted to support the bill appropriating $60,000 to represent Maryland at the St. Louis Exposition.

The Nominating Committee reported (page 182) nominations for President, Vice-President, Secretary-Treasurer and County Vice-Presidents. On motion the report was adopted and the officers named elected.

Mr. Richard Vincent, Jr., read a paper (page 160) on Growing and Marketing Produce in England.

The report (page 91) of Capt. R. S. Emory as Committee on Packing and Marketing Fruit was in the hands of the Secretary and was read by title.

Messrs. J. P. Blessing and W. G. Dawson reported on Transportation (page 92).

Mr. C. R. Hartshorn, Vice-President for Montgomery County, reported—page 38.

Dr. E. P. Magruder, Vice-President for Prince George's County, reported (page 40).

The Secretary announced the death of Mr. J. S. Ballinger, Vice-President for St. Mary's County.

Mr. Orlando Harrison reported (page 46) as Vice-President for Worcester County.

The report (page 77) of the State Pathologist and of the Committee of Botany (page 73) and Plant Pathology (page 77), and other papers, for lack of time, were read by title.

The Committee on Resolutions reported, and on motion of J. P. Blessing the report (page 183) was adopted.

On motion of Mr. Geo. O. Brown, Prof. F. A. Waugh and Dr. H. J. Webber were elected honorary members.

The Society adjourned.

Reports of the Executive Officers.

SECRETARY.

J. B. S. NORTON.

Upon the resignation of A. L. Quaintance as secretary in March, 1903, I took charge of the work, completing the publication and mailing of the fifth annual report. During the season I have had printed and distributed to the Vice-Presidents and other officers stationery for their official correspondence, have attended to the correspondence of the Society, prepared for the two executive board meetings and arranged and announced the summer meeting at Mr. Allen's, reported elsewhere, at which about fifty members were present.

The preparations for the sixth annual meeting and its announcement has taken considerable time and thought. Every effort was made to secure a strong exhibit of vegetables and fruit, but for several reasons it was difficult to get material for this purpose, mostly owing to the failure of several crops and the counteracting influence of preparations for the St. Louis Exposition.

The membership has increased to 2,593.

TREASURER.*

Receipts.

1902—		
Dec. 16, cash on hand	$107.84	
1903—		
Jan. 20, received State appropriation	1,000.00	
Total amount of cash received		$1,107.84

Expenditures.

1902—	
Dec. 20, Paid A. L. Quaintance, sundry expenses in connection with 5th annual meeting	$49.74
Dec. 20, Paid Henry Ewalt balance on hall rent	45.00
Dec. 23, Paid Carrollton Hotel bill of H. K. Lewis, stenographer	6.00
Dec. 24, Paid Adams Express Co. express on apples	3.71
Dec. 30, Paid American Bonding and Trust Co. premium on bond for secretary and treasurer for 1903	15.00
Dec. 31, Paid G. H. Calvert for stamps	10.00

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* See Report Auditing Committee.

1903—		
Jan. 3, Paid Richard Vincent express on exhibit and advertising meeting	5.05	
Jan. 5, Paid R. S. Emory express on fruit exhibited	1.35	
Jan. 5, Paid G. H. Powell expenses at fifth annual meeting.	2.00	
Jan. 5, Paid A. L. Quaintance as per order of Executive Board	100.00	
Jan. 17, 22, Paid H. K. Lewis for reporting fifth annual meeting	50.00	
Jan. 28, Paid J. B. S. Norton expenses connected with fruit exhibit	1.25	
Jan. 28, Paid L. A. Goodman expenses at fifth annual meeting	72.00	
Feb. 4, Paid Beck Engraving Co. for half tones	26.32	
Mar. 14, Paid A. L. Quaintance sundry expenses as secretary	4.80	
Apr. 1, Paid Carrollton Hotel for room used by Executive Board	3.00	
Apr. 1, Paid B. & O. R. R. for freight on annual reports	3.11	
Apr. 2, Paid J. B. S. Norton for stamps used in mailing fifth annual report	159.96	
Apr. 6, Paid Chas. G. Biggs expenses at Executive Board meeting	7.50	
Apr. 6, Paid A. L. Towson expenses at Executive Board meeting	2.00	
Apr. 6, Paid W. G. Dawson expenses at Executive Board meeting	6.00	
Apr. 7, 10, Paid C. F. Sudwarth for printing fifth annual report	389.66	
May 11, Paid C. F. Sudwarth for printing letter heads	4.50	
May 11, Paid G. H. Calvert for stamps	8.00	
May 11, Paid B. & O. R. R. for freight on reports	.50	
July 18, Paid G. H. Calvert for stamps	5.00	
July 18, Paid Chas. G. Biggs expenses at Executive Board meeting	5.00	
July 28, Paid S. O. Bowdon for stamps	4.50	
July 28, Paid J. W. Kerr expenses at Executive Board meeting	3.05	
July 28, Paid Orlando Harrison expenses at Executive Board meeting	5.00	
Aug. 29, Paid S. O. Bowdon for stamps	10.00	
Aug. 29, Paid J. M. Burlew for office assistance	9.00	
Sept. 21, Paid C. F. Sudwarth for printing letter heads	3.50	
Dec. 31, Paid American Bonding Co. premium on bond of treasurer for 1904	15.00	
1904—		
Jan. 4, Paid S. O. Bowdon for stamps	20.00	
Total expended		$1,056.50
Balance on hand		$51.34

SUMMARY OF EXPENDITURES.

Secretary's office, stamps, stationery, bond, etc.	**$109.30**
Secretary's compensation	**100.00**
Executive Board meetings, expenses	**31.55**
Printing and mailing fifth annual report	**579.55**
Expenses of fifth annual meeting	**236.10**
	$1,056.50

J. B. S. NORTON, *Treasurer.*

DISCUSSION.

MR. A. L. TOWSON: I would like to say something in regard to our bill for postage, as reported in the Treasurer's report. We have nearly 2,600 members, and have to spend over half we receive for postage. It is a very large amount, and it seems to me there ought to be some way to provide for the free distribution of these reports. It seems to me that there should be some provision made by which these reports could be mailed free to members of the Society. It is a growing expense, and as our membership increases, it will eat up the whole amount.

THE SECRETARY: That amount of money also included the cost of printing, which uses the larger part. It cost something over $150.00 to send them out to the 2,500 members.

MR. TOWSON: I think that could be saved. If we make an effort, we might succeed.

PRESIDENT SILVESTER: It would be impossible for such an organization to secure such a privilege. I suggest the publishing of a quarterly by the Society, one number to be the Annual Report, the other numbers to contain such horticultural matter as would meet the approval of the president and secretary of the Society. In this way a greater reduced rate could be secured and besides your Society would have an official organ.

FIELD MEETING OF THE MARYLAND STATE HORTICULTURAL SOCIETY ON THE FARM OF W. F. ALLEN, SALISBURY, MD.

VICE-PRESIDENT GEO. O. BROWN.

The field meeting of the Maryland State Horticultural Society on the farm of Mr. W. F. Allen, near Salisbury, Md., August 6, 1903, was a great success both as regards attendance and the educational features the visitors found.

The first attraction on the arrival of the visitors about noon was the long tables set in the woods. A bountiful repast had been prepared under the personal direction of Mrs. Allen, and was also served under her direction. Mrs. Allen was aware that the guests would bring their appetites with them and proved that she knew how to attractively serve the many good things that had been prepared for the occasion.

The tables with their vases of flowers, pyramids of magnificent peaches, piles of fried chicken, coffee steaming hot, etc., certainly presented a handsome and most inviting appearance. Near by was a table about ten feet square, which was piled high with a lot of luscious Rocky Ford cantaloupes. All the accessories for testing their quality were at hand—spoons, salt and pepper. Soon after the attack commenced, and every one had a satisfactory feast on fine melons.

Mr. Allen's farm consists of 500 acres, and he has another nearby of 250 acres, and one at Princess Anne of 485 acres. What the visitors went mainly to see and learn about was cantaloupe growing. A number of teams were kept busy carrying the visitors to different points of interest. A 60-acre field of cantaloupes was being harvested. The process of picking, hauling, sorting, packing and loading in the cars was eagerly followed by the interested spectators. There were forty-two hands picking and three teams hauling, and scores engaged in sorting and crating. The packing shed is located by the railroad and the melons are loaded in refrigerator cars and are shipped to Boston and New York.

A 30-acre field of strawberry plants was looked upon as a thing of beauty to the visitors. Mr. Allen's shipment of strawberries the past season, he said, was very disappointing, as he had only ninety car loads, when he had prepared for and expected to have 300 carloads. In the grove near the tables were large piles of fine-looking onions—hundreds of bushels. The onions had been grown in between the rows of strawberry plants that had been grown that year and which the visitors had so greatly admired. The simple operation of caring for the plants had also served to cultivate the onions, and resulted in a crop of considerable profit over the cost of planting and cultivating the strawberry plants. The innovation showed Mr. Allen had ideas of his own, and that he works with his head as well as with his hands.

An unexpected surprise to the visitors was a peach orchard of about twelve acres. The variety grown is known as Ray. Originally it came from a friend in Mississippi, who sent some trees to Mr.

Allen. Experts pronounced it a combination of the Elberta with another variety. The fruit is handsome, and the color brilliant. The trees are strong growers, and the experts to a man agreed it was the finest peach orchard they ever saw in the State. Mr. Orlando Harrison said he had budded 5,000 trees with the Ray for Mr. Allen. The variety does not seem to be for sale anywhere. Mr. Harrison says the Ray seems to be especially suited to the light, sandy soil conditions of the Eastern shore.

Mr. Allen was building a new barn, 48 x 140 feet, which will have stable room for thirty horses and storage capacity for a year's supplies. Mr. Allen never keeps less than fifty hands, and at the time of our visit had 150 at work. These figures do not include the enormous extra force he has to employ in strawberry picking time.

After dinner Mr. Allen was called upon for a speech and asked to tell how he had achieved his success. A man cried out: He can tell it in two words—"hard work." Mr. Allen said he was no good at speech-making—wasn't built that way—but would try to answer any questions asked of him. Questions all along the line followed rapidly, and the information gleaned was that Mr. Allen planted Rocky Ford seed in hills four and a half feet apart as early in April as possible; fertilizes well before planting, using good fertilizer, and also believes in the liberal use of barnyard manure; harrows in and then plants the seed. He buys from New York from 80 to 90 carloads of horse manure every year. It costs about $75 a carload. Cantaloupes to be of good flavor and sweet must have plenty of sunshine when nearing the ripening stage. Careful packing and uniformity in selection are friend-making and a great selling factor.

Gen. Joseph B. Seth called for the thanks of the audience for the grand entertainment and practical information the host had given them, which was responded to in a most hearty manner.

Reports of the County Vice-Presidents.

BALTIMORE COUNTY.

RICHARD VINCENT, JR.

Mr. President and Gentlemen: I have a very small report to make and intended to say very little on the subject; but after hearing what my friend, Mr. Davis, has to say, I have decided to say a little more than I had intended. Our text thus far has been Caroline County, and I believe that it is a very nice county, and has very nice people, from what I have seen of them; but he never said anything of Baltimore County, and we Baltimore County people have got to think there is no place counts like Baltimore County. They may emigrate to Caroline after awhile, but not while there is a small piece of our county left; because Baltimore County, with its beautiful hills, valleys and dells, is grand from start to finish and is fast becoming a county of splendid homes. And as for strawberries, the gentleman from Caroline County has never tasted the berries we grow, especially when the cream from some of the finest cows the world has known has been added,—we have them. And if he was once to taste Baltimore County berries and cream, he would only want to go back to Caroline County once more and that time would be for a move to Baltimore County. [MR. DAVIS: We don't have to use cream on our strawberries. They are so fine it is not at all necessary.]

I have very little to report for Baltimore County, and in excuse I must say that I have been away from home, therefore have not seen or heard as much from my own county as I possibly would.

I have a recommendation to make, and that is that, instead of one man two be appointed from my own county, one from the northern section, and one from the southern, as the products are so different between the northern and southern that I think the interests would be better looked after.

Our friend, Mr. Powell, recommended the same in regard to his county. The upper section of Baltimore County is given over to the dairy interest and grazing, the central part to the fruit interest and the lower, entirely to trucking. The land brings such an enormous quantity of trucks or other crops that you could not induce the growers to return to fruit, which was once a big factor in this section, especially this season as the land in spinach, cabbage and other vegetables, of like variety, has brought more money than ever was taken from the same land in fruit. And to verify these statements and see the enormous interest in this branch of industry, one only needs visit our wholesale markets any day, and he will exclaim, "the fruit interest is only a drop in the bucket."

Gentlemen, we are asking protection in regard to our pine, holly and cedar and other beautiful trees that make our county cheerful when the snows of winter are on us. The way the vandals are robbing our woods and forests of greens, etc.! Even our lawns are known to be robbed of some pet specimens of evergreens. Some more stringent law than we now have has got to be enacted, or everything we have in this line will be carried to market.

DISCUSSION.

DR. VON HERFF: I heartily endorse what the speaker has just recommended. It is a fact that evergreens are now being destroyed in the southern forests by the wholesale. There are firms who make it a business to rent thousands of acres of forest land for the purpose of removing evergreens, and their destruction is going on at a very rapid rate.

MR. BIGGS: We need no such law as that. Our criminal code provides ample punishment for injury of any character to growing trees. Destruction of trees is punishable by fine, or imprisonment in the house of correction, in jail or in the penitentiary, or both fine and imprisonment in the discretion of the court imposing the sentence. Of course you must catch the offender; we may enact all manner of laws, but if we fail to convict the offender, they will be of no avail.

MR. DAVIS: For the benefit of our "Creamy gentleman" of Baltimore, we want to say to the residents of Baltimore to come to Caroline for your cedar, holly and pine, and make the city of Baltimore happy. I am a representative of the people of Caroline, and the invitation is just as wide as the county itself in magnitude.

ANNE ARUNDEL COUNTY.

JOSHUA S. LINTHICUM.

In making my annual report for Anne Arundel County for the year 1903, I approach this duty assigned me with considerable timidity, as the season this year has been very unfavorable, and not being able to explain the causes for the failure in being as successful as in former years, your representative, in looking at the effort of the tillers of the soil, must confess that no lack of energy or necessary preparation in supplying the soil with manure or fertilizers or careful cultivation were neglected. The best of seeds that the market could afford were sown, very little complaint was heard in regard to the germination, a fair stand was obtained, a larger acreage was planted of the usual crops; however, the result was far from being satisfactory. Owing to the climatic condition the first part of this year everything looked favorable for large crops, but the sudden changes of the weather from wet to dry, and cold to warm affected our crops seriously.

The first crops that are marketed in this locality—spinach, lettuce, onions, etc.,—grew fair and sold for prices not very remunerative. The next—strawberries—has been considered heretofore the best paying crop that is cultivated in our county, but owing to the season, strawberries were a poor crop in quality and quantity. Although in March and April the prospects for a large yield and good crop were never better, as we had no killing frost to injure the fruit. The bloom was prolific and the vines loaded with fruit which grew well until the time of ripening, when we discovered that the vines began to fail, rust and have defective roots. Much of the fruit perished before ripening and the quality of this delicious fruit did not come up to the usual standard; it did not ship well, lacked flavor, and prices were moderate. Many berry growers did not gather one-half of their fruit owing to the quality being inferior and prices not justifying the gathering.

Little peas, called June peas, were planted extensively, but this crop yielded poorly, with prices fair. Of marrowfat, called sugar peas, a large quantity was planted for the packing houses in Baltimore city. This, in the past, has been a good paying crop, but this year the pea louse and blight was destructive and the result a poor yield. Snap beans proved to be a paying crop and good prices were realized. Early tomatoes, those that the plants were raised in hot beds under glass, were somewhat affected by fungus or blight, yet fair prices were obtained. Late tomatoes are largely cultivated and the canning factories consume nearly this entire crop at low prices. Cantaloupes, heretofore being an important crop, were, this year, almost a total failure, many growers did not realize a nickel on this crop owing to the unfavorable season. The watermelon crop was very short, but prices favorable. Sweet potatoes grew well although not yielding as well as in previous years and commanded a moderate remuneration. Corn, wheat, oats, rye and other cereals yielded moderate results.

I have been referring in this report to the citizens who cultivate the soil in the fifth, fourth, third and a part of the second election districts of our county. In the first, eighth and the greater part of the second districts, the principal crops are wheat, rye, oats, corn and tobacco. The yield of these was a fair average, remuneration moderate. The tobacco acreage planted is somewhat diminished, the yield good, and of fine quality. There was some little complaint of its being damaged in the house owing to damp, sultry weather while curing. The prices are now good with the prospect of an advance later on, as the demand for foreign trade has increased.

The cities and towns in our county are flourishing. Annapolis, the capital of our State, has made wonderful improvements, her streets are in fine condition, our court house has had fireproof vaults built for the protection of much valuable papers against accidental fire, a new post office, also a large commodious building for the Court of Appeals and other State offices, the ancient State capitol has been remodeled and enlarged, and many private residences have been erected. Brooklyn, South Baltimore, Curtis Bay, Glenburnie, Severn, Harman's and Eastport have been improved with new buildings and increased population. In Brooklyn and vicinity much capital has been spent in erecting large buildings and plants for fertilizer manufacture, canning houses, car shops, etc. I merely mention this to show that our county is alive and growing.

In regard to growing and cultivating a crop for the next year, after careful observation I conclude that the citizens of our county are not discouraged by the partial failure of many crops planted during the present year. I find them encouraged with strong hope for more successful results.

I will further state that apples, peaches, pears and cherries in this section were scarce and not extra in quality. I am sure if our people were to pay more attention to fruit growing their chance for production would be much enlarged.

CALVERT COUNTY.

FRANK O. SMITH.

The horticultural conditions of Calvert County, for the past year, are far from being an advancement over the preceding year. One cold night in April last destroyed the peach crop, with exception of a few varieties, chiefly the very early fruit, even that being more or less injured. I had two trees one year old, each of which developed and ripened one peach June 15th. The late varieties, such as Crawford, Cooper's, Fox Seedling and others ripened a small quantity in several orchards that sold at high figures, some bringing $3.10 per box, but only such trees as were protected by buildings, wind breaks and the like, having any quantity of fruit. The season for peaches proved unsatisfactory. Pears, plums and kindred fruits shared similar fate, only showing about one-tenth of a crop. Apples promised better until near ripening, when they began to drop and decay with the result no one had any nice fruit for winter use. As might be expected from such failures, the orchards have not received as much attention as they should, and horticultural interests have not advanced as they would with a satisfactory crop.

The old peach orchards are fast passing away and only a few persons are planting young orchards, partly because of unsatisfactory results in the past, and the fear of San Jose scale, which has made its appearance in some localities. Various remedies have been tried with varying success. On the whole, I think, I can say it is confined to the orchards in question. I have not heard of any extension, but I think it is mainly due to the fact that few young orchards are being planted. This section is specially adapted to fruit, and those persons in search of fruit land can not do better than investigate our soil. No finer fruit can be found anywhere than that grown here in favorable seasons.

Strawberries were satisfactory to those raising them, but only two or three persons have more than family plots. The few that had them were well paid, and have added to the acreage. Raspberries are also being planted in small quantities. The proximity of our section to several large cities should induce the planting of small fruits, all of which grow luxuriantly and generally prove remunerative. This being strictly a tobacco section, only a few are interested in horticultural products. Let us hope for more advancement in the future.

CAROLINE COUNTY.

JEROME A. DAVIS.

Caroline County is one of the counties of the Eastern Shore of Maryland and the improvements that have been made there in the last thirty years have been recognized by our city cousins of Baltimore to such an extent that when they visit Caroline, and they made early visits, they would bring their trunk and did not mark the trunk at all. Now they come and bring their trunks and have a card on them. They spell out Caroline County in full. So you will know that they recognize the advancement.

I don't want to say anything that seemingly would be little. I want to say, gentlemen, that we of Caroline County believe that if the people of Baltimore only knew the value of Caroline County as we know it, they would make an effort to tow it across the bay and use it as a park. The county was insulted grossly yesterday by Mr. Massey. I wish he were here in order that I might tell him so. I want to say that 99 per cent of the herrings are consumed in Baltimore City, and it is the only product we can ship there for which we receive proper remuneration. We are going to get down to facts and prove that Caroline County is the banner county of this State. Take the canned goods for instance. There were more tomatoes canned in Caroline than in any other county in this United States. There were more cases of tomatoes canned in Caroline and they received for them $1,500,000. There is not a man, woman or child but what has money. Our President has piled up so much that he had to retire. He could not invest his money without trouble. We will also take corn, peas and strawberries, which are canned in abundance in Caroline. Now we are going to take the strawberry, and that, with us, is very fine. You all know that New York market is the great produce metropolis of this United States. More fancy fruits are used in New York than any other city in the Union, and a little article that appeared in the *Rural New Yorker* leads us to believe that we are the champions there, and in behalf of Caroline, I challenge any county as to quantity and quality of fruit grown per acre, and you know that New York receives fruit from the Gulf to Lake Ontario and from Nova Scotia on the east to California on the west.

Our President has been talking of the fertile soil of Caroline. I will show you what was grown on one acre. The gross receipts were $1,132.00. In Caroline County, where herrings, according to Massey, have first place, $1,132.00 for one acre, but every plant was made to do its work.

Now we will take the Lucretia dewberry, and no wonder we said we need only the one variety. They will give us berries as long as we need them and they are as profitable as long as we can ship to New York, and cannot come in competition with the Wilson's Early. $105.00 net was the profit per acre of one of our foremost dewberry growers of Caroline County last season. They took out fertilizers, work and shipping, and the commission merchant didn't want the money, so he sent it back. So you see that Caroline County don't propose to be done by any county in the State of Maryland.

As to raspberries, we grow the Miller raspberry, just as good and prolific as any section of the country. They brought back over $100.00 per acre.

DISCUSSION.

Mr. A. N. Brown: I don't want to ask any questions. It was not my fortune to hear all of that report, but as a horticulturist, as one interested in the subject, I can't for the life of me understand why it is necessary for our worthy President and Mr. Davis to be continually rubbing it in regarding the fertility of the soil and of the fine products of Caroline County.

A Member: Have you any yellows?

President Kerr: We have yellow peaches. No sir, the yellows is almost unknown in Caroline.

CARROLL COUNTY.

DANIEL WOLF.

Mr. President and Brother Members of the Horticultural Society: I never like to shirk a duty—but there is certainly some irregularity in appointing a Frederick County man to represent Carroll County and particularly so, when there are so many better men in Carroll County than I.

But as I have not kicked out of the traces heretofore or made any protest against serving in the office you did me the honor to confer, I will endeavor to make a report however unworthy it may be for the occasion.

The topics I may have to discuss will be mostly of a general rather than of a local character for the reason that there has not been any very recent introduction of new orchard or field pests or nuisances. In the fall of 1902 I had cherry and peach trees attacked by bark beetle, known as hot-hole borer. Whilst they did not strike many trees what they did strike were struck hard. The worst I removed and burned; on others less injured I hunted out the insects with a knife, then washed the trees with a strong solution of whale oil soap and Babbitt's lye. I was much alarmed at their appearance for their destruction was so rapid. I had not noticed them until the latter part of August or beginning of September, yet before freezing weather they had killed outright several trees and seriously damaged others. I looked forward to the coming year with dismay, but to my delight could not discover a trace of them. I did not hear of their ravages in the surrounding neighborhood.

The San Jose scale has attacked a few of my peach trees, but so far not much harm is done. I have been spraying under the direction of College Park officials and have held it in check, but not yet eradicated it. West from Union Bridge a few miles the scale prevails to an alarming extent, threatening to overwhelm us in the near future unless better means of destroying them is learned. Is there ground for hope that the lady bird beetle will come to the rescue? I would like to know how successful the experiment now being made in Washington has been. In 1901 I saw a report stating that out of seventeen lady bird beetles in the insectory there, only two females survived till egg-laying time. Since, I have not heard how the breeding has progressed. One thing sure they have got to be mighty prolific if they are successfully to cope with the scale. We may only hope they may prove a remedy for the evil that is upon us. They tell us a flea

> Has smaller fleas that on him prey
> And these have smaller still to bite 'em.
> And so proceed ad infinitum.

So may it be with the scale. I hope he may find many enemies.

In common with other sections of country we have our pests and nuisances. One among the most annoying to gardeners and fruit growers is the English sparrow. The importers of this bird made a very bad mistake in turning him loose upon us. No greater evil ever escaped from Pandora's box; from being insectivorous birds in their native clime, they became seed and fruit eaters here, and being also extremely pugnacious and prolific they have by mere force of numbers driven our useful birds away. Then the fair sex, who always will adorn themselves in borrowed plumes, must be responsible in part for the destruction of our good birds. The two combined have deprived the horticulturist of his natural protectors, and all your kerosene emulsions and Bordeaux mixtures will not compensate him for his loss.

I have just read in the newspapers of a rabbit hunt in a western state where 700 hunters went out on a hunt and corraled 10,000 rabbits. In some of the breeding yards in California, the Belgian hares have accumulated to such numbers that the owners have threatened to turn them loose, but the authorities have forbidden it. So long as they are confined no harm can come from them; but supposing they are set free there is a probability that they may become a nuisance. We can all remember the destruction in Australia by English hares introduced there.

In conclusion I would like to have the opinion of the experienced fruit growers assembled here on the chances of peach and plum fruit buds surviving the recent cold snap. The thermometer registered from 14 to 20 degrees below zero—a temperature supposed to be fatal to peach and plum buds, and generally proves so. Yet when the surrounding conditions previous to the freezing have been favorable, may it not modify the case? Vegetable physiologists tell us that when the tree ripens its wood well, all the sugar, starch and albuminoids are withdrawn from the leaf and concentrated about the buds, and the bud itself is closed more securely enabling it to resist more cold. Our trees, I think, ripened their wood well before the winter set in. Since winter it has been uniformly cold and dry and was, at the time, of the hard freeze; and the thaw, if indeed it has thawed since, very gradual. All these circumstances it seems to me are favorable and encourage hope.

As this is my first essay at a report to this august body of horticulturists, I hope you will judge its defects and shortcomings charitably.

CECIL COUNTY.

GEORGE BALDERSTON.

To the Maryland State Horticultural Society: There is little new to report upon in this county that has come under my notice in the horticultural field in the past season.

We have not had a full fruit crop in any direction, and the early and small fruit business does not amount to much as a money crop in the county, only a few that may be called market gardeners being specially engaged in it. We have an abundance of soil suited to these purposes, especially in the southern and tide water sections, but the transportation facilities have not been developed to give them ready access to the city markets.

There are excellent strawberries that grow in Elk Neck that ripen ten days or more in advance of those on our hills, which gives them a decided advantage in our local markets, but I do not learn that the sale of them is pushed except in their home town of Elkton. This is not as it should be while Port Deposit is a large consumer of early vegetables that are now brought from Baltimore, and suffer from the delay incident to reshipment, as well as having to pay two freights and a profit to a commission house.

This town of Port Deposit is now largely supplied with fruit and early vegetables by that brought from further south by water, and the one large steamboat that makes daily trips offers cheap and safe transportation. The railroad rates on many kinds of bulky produce are now absolutely prohibitive. This town of Port Deposit has only recently developed as a market for first-class produce and vegetables by reason of the opening and enlargement of an institution of learning there that gives employment to a large faculty, and they, as a rule, demand the best.

While the cheap water freight brings the early vegetables and fruits, it also discourages the local production of these things that reach a market already stocked before our local crop is ready, and this points to the reason for which this is mentioned in this report. There is yet an open market for the best and always will be where there are people to feed who know a good thing when they see it or have once tasted it, and will no longer be content with stale vegetables when they have the means to buy fresh ones. The writer has proven this in one direction by making a specialty of lettuce grown under glass that finds a ready place where ever once known, and those having suitable soil and the earlier location of the southern end of our county might if they would quadruple their crops of early garden vegetables and find a home market for them.

In this connection I might mention asparagus. The beetle that has come to attack this vegetable did not seem so plentiful the past season, and it may be that its course has run for a time. But I would also notice to invite discussion of the many varieties of asparagus, advertised by nearly all our seed catalogues, every new one of which is to produce a larger growth than its predecessors or spring up with a crop earlier. I have not tested all these "Colossal" and "Mammoth" monstrosities nor do I intend to, that is a work for some experiment station, but I submit what everyone with good eyes and a little botanical knowledge can see for himself, that the plant is one of those termed dioecious, which means that it has male and female plants, or if there is any sort that will produce perfect flowers on one plant, I have never seen or read of it. All our roots are now grown from seed and every seed is a cross between its male and female parent, and thus of necessity every single seedling plant is different in some particular from every other, and there can be no true and distinct variety maintained, while this is the case, unless it be by subdivision of the root. That some sections and growers may have finer asparagus than others is admitted, but it is due to good culture and congenial soil and not to any merit in the name of the seed. This subject is an important one and seed growers should not be permitted to knowingly deceive a credulous public.

By cross fertilization and artificial aid to nature some wonderful results have been obtained and we wait the advent of some Luther Burbank who shall give us a pear with the vigor of the Keiffer and the sweetness of a Seckel.

The tomato crop of our county was only an average one, but differed from former years in that the fruit maintained a good quality to the last.

The past season was marked by the entire failure of the cherry crop in this section, the few that did partly ripen were not enough to feed the birds and their hunger had to be supplied from the raspberry crop, so there was also a shortage in it. Our native varieties of cherries have been the standby for feed for birds and have left a surplus for human use, and we miss them. But we do need more of the best varieties that will combine more hardiness of tree and fruit. Those called hardy, that our winters do not kill, are yet apparently short lived, and it would do our eyes good to see trees two feet in diameter covered with large and luscious fruit.

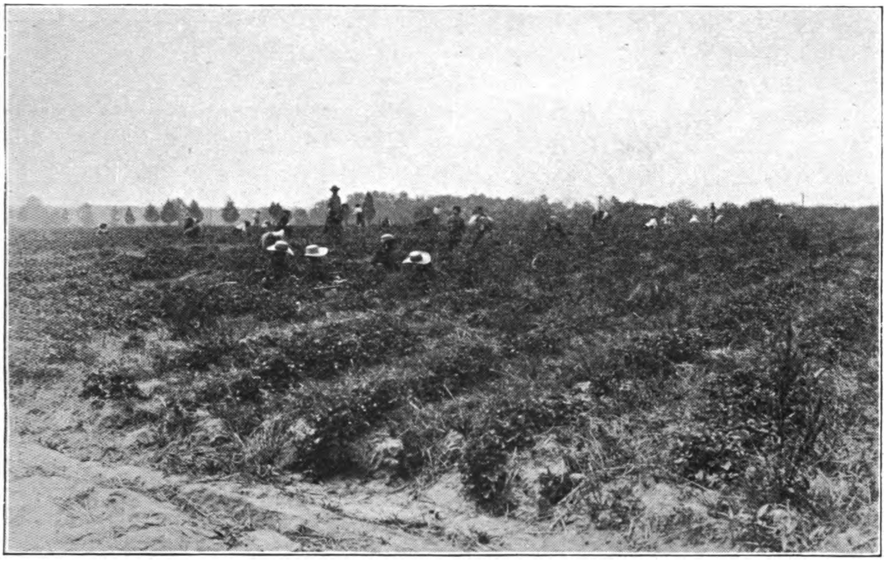
Peaches and plums also failed us, nearly; probably due to frosts.

With this record of the season, I close this report. What the next may do for us remains to be seen, but we have had no warm winter to swell the buds yet and thus add to the risk of a failure in next season's crop.

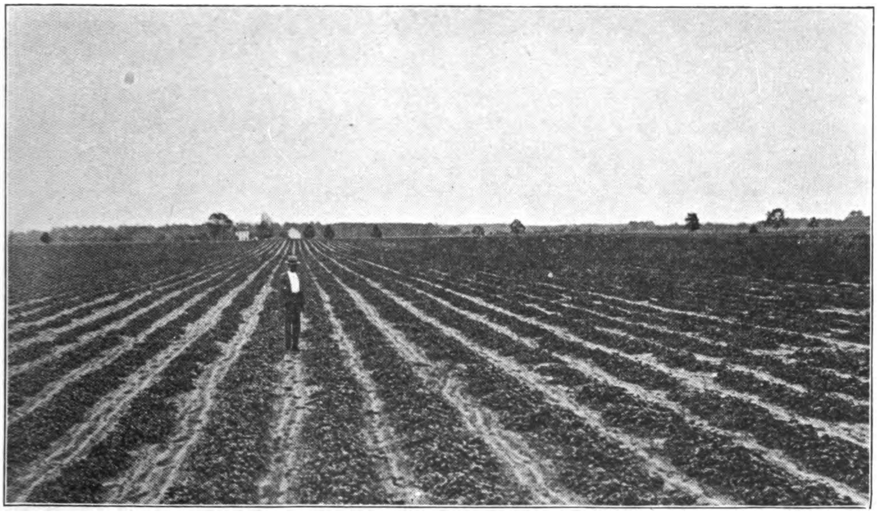
CHARLES COUNTY.

W. W. COBEY.

Well knowing the lack of interest manifested by our farmers in horticulture, I very reluctantly make the following report. The farmers of Charles County for many years have made tobacco the one important crop, to the exclusion of others which, perhaps, might have been equally as profitable. But conditions have changed, and we realize the fact, and our methods must change if we expect to keep abreast of the tide. During the period of 1885 to 1890 there was a growing interest manifested in fruit growing, and many started in planting orchards and were increasing the acreage year by year, feeling fully assured from the prices we were then realizing and the satisfactory yields of fruit and its fine quality, that we could well supplement fruit for some of our staple crops. Then just as our orchards were coming into profit, the San Jose scale put in its destructive work that checked the fruit growing of Charles County. We did not know then how to effectually combat this little pest and most of the commercial orchards were destroyed or abandoned. Those that remained were injured, but the scale has been held in check by using



Picking Strawberries.—W. G. Dawson, Cambridge.
(Photographed by Prof. C. F. Austin).



Strawberries at W. F. Allen's, Salisbury.—100 Acres.
(Photographed by State Hort. Dept).

the spray pump. Our soil is well adapted to fruit growing and we have cheap transportation, from our geographical situation. We depend largely upon water transportation which, though slow, is cheaper than the railroad, which fact was forceably impressed in August, 1900. The price of peaches reached a very low mark, yet I could ship at a small profit, while my western Maryland brother at the same time was shipping at a loss, owing to the difference in freight rates, hence if western Maryland can grow fruit at a profit, surely southern Maryland can grow it at a greater profit on our cheap lands and with cheap labor and low freight rates, surely we of southern Maryland should not feel discouraged.

The canning industry would be even more profitable than fruit growing for our land produces the best of vegetables as well as fruit. Let us have canning houses scattered over our county at the numerous shipping points and encourage fruit growing, and it will bring about an era of prosperity. We have the best wishes for the success of our State Horticultural Society and that the inspiration may grow and spread until it embraces the whole of our State.

GARRETT COUNTY.

CHARLES T. SWEET.

I have not much to report for Garrett County, for in fact, there are very few horticultural products in this section for market. Our people are only just awakening to the fact that they can grow as fine vegetables, fruits and flowers as can be produced anywhere, when care and skill is bestowed on them. Our climate is peculiar on this elevated table-land, so there are some crops that no county in the State can equal us in growing, cauliflower is one. It takes a good while to bring fruit trees into profitable bearing up here, but I know old men who say certain trees were large old trees when they were boys, these trees are now two or three feet through and perfectly healthy—the race is not always to the swift. I don't know of a case of San Jose scale in the county—our altitude, shorter season, parasitic fungi and preying insects are all against it. With me the "dust method" came this season and to stay. It is safer, readier and better adapted to rough hill sides. I think it is more repellant to the curculio, and I had no plum rot in 1903, while I have lost largely from it before. Strawberries, raspberries and blackberries all did well and brought good prices. Apples were a failure generally and where they bore were small. My own, though small, were all that could be found at all suitable to send to the St. Louis Exposition.

HARFORD COUNTY.

CHARLES VAIL.

As there appears to have been no report from Harford County at our last annual meeting, I might say by way of introduction, that with perhaps the exception of the mountain region of western Maryland, ours is probably one of the best sections for general fruit culture in the State. With a soil rich in potash, and susceptible, of a high state of fertility, given a good market, at prices that will encourage production, the possibilities of Harford County can scarcely be estimated. Horticulture, however, is not a leading interest at present, still much good fruit is produced, apples occupying the most prominent place, of which we had one of the largest crops the past season ever grown in the county. It was simply immense, but with the low price prevailing at picking time, not much profit was realized by the average farmer, good fruit selling as low as 60 cents per 100 pounds. Some trees were broken by the excessive load of fruit, while others were surprising examples of what a tree can bear without serious breakage, one instance is reported of a tree of York Imperial yielding 60 bushels.

Plums were almost a total failure owing, apparently, to the late freeze when the trees were in bloom, which was profuse.

Pears and peaches gave a light crop as a whole, but some fairly good yields and some fine fruit. I would mention particularly some fine specimens of the "Foster" peach, which came under my observation, one of which measured 11¾ inches in circumference.

Damage by insects and fungus diseases was probably less than in average years, and much less than in some dryer seasons, although potatoes, which were a big crop, rotted badly in numerous instances. No serious blight attacked tomatoes, and less smut developed on wheat and corn than is frequently the case. Tomatoes, however, were rather a short crop, and consequent light pack, which, coupled with the low price of canned goods prevailing thus far, caused little profit to be realized in general by either grower or packer; though some very good individual yields are reported, reaching 300 to 400 bushels per acre.

The corn crop on high land, when well cared for, was generally good, while on low land it was, in many cases, very poor; so much rain interfering with cultivation and favoring the growth of grass and weeds to the detriment of the corn. In some cases the land was not as well prepared as it should be before planting, a fact that suggests the thought that probably few if any of us give our soil the thorough preparation before seeding that would prove most profitable, or have ever yet realized the greatest benefit that may be derived from extra cultivation at the proper time, evidence seeming to accumulate, which strikingly illustrates the importance of intelligent intensive culture, in order to obtain the best results.

The wheat crop, in the main, was light with small, shrunken grain, many yields not exceeding 10 to 12 bushels per acre, while few reached or exceeded 25 bushels.

The hay crop, while not as heavy as in some seasons, was considerably above the yield of the previous year, some fields averaging two tons or more per acre of cured hay.

Perhaps I have deflected somewhat from a strictly horticultural report in my reference to grain and hay crops, but most of us who are interested in one are, more or less so in the others. Before closing I would briefly return to the enemies of the fruit culturist by reference to the San Jose scale, which has not yet given us much trouble, but having made its appearance in a number of places in the county, we may reasonably expect to have it to combat in the near future, and we want the best light that science and research have developed for its extermination and trust we may have the privilege of profiting by the experience of some of you who have not only made it a study but have achieved practical results.

HOWARD COUNTY.

W. S. POWELL.*

Mr. President and Gentlemen: When Professor Norton requested me to make a report on the fruit interests of Howard County for this meeting, I am afraid he overlooked the fact that I live in the extreme southern end of the county where it joins the counties of Prince George and Anne Arundel, not knowing the conditions prevailing in the upper end of Howard. I must confine my report to the section between Elkridge and Laurel, incidentally taking in the northern sections of Anne Arundel and Prince George's.

My innate love of the country and interest in growing crops leads me to believe that I am a natural agriculturist—don't understand me to say a successful one. Of necessity I was a merchant for more than twenty-five years. Some twelve years back I concluded I had done city drudgery long enough and began to look around for a farm having the conveniences, location and advantages I thought desirable, always keeping in view the fact that after my city life that I would not be able to do the hard work of the farm, but I considered I had vim enough left to trim fruit trees and market their products, so I turned my attention largely to fruit. As the farm I selected seemed admirably adapted for this purpose—free soil, well drained and immediately located at a railroad station convenient for quick delivery to the central markets of the country.

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*By request—Rush Smith, County Vice-President.

I found. on examining the trees of the section, many aged apple, cherry and pear trees retaining their shapes and in full bearing, conveying to my mind that under natural conditions that trees in this section were long lived. In passing, I might here mention that on one of my farms I have an apple orchard in fairly good condition, producing last year a full crop, that has been in constant bearing since 1857—46 years—and in this orchard are many apples that I cannot get named, even by experienced fruit growers. One particularly fine, light-colored, summer apple I sent to Washington for identification; the reply was: "Not certain—believed to be a summer Greening—feel sure it could be improved by trimming and fertilization." This was useful information. I also have what I believe is the largest pear tree in the country, I call it an old field variety, that in pear years has borne as much as two two-horse wagon loads of fruit; but I am diverging.

When I settled at Annapolis Junction in the section I have mentioned, there were many thrifty and profitable peach, pear and plum orchards. I do not know of a single one now. The yellows, the blight, San Jose scale and other fruit troubles have cleaned them out. My own experience has been most expensive and unpleasant. I thoroughly prepared a piece of land, purchased the best stock obtainable from one of our state nurseries and had them plant me an orchard consisting of 200 York Imperial apples, 400 Champion quinces, 250 Bartlett pears, 250 Kieffer pears, 50 assorted plums and 200 assorted peaches, and between these, leaving room for cultivation, 1,000 currants and 3,000 gooseberries, and now all I have left, without a single full crop, except apples the past year, is 175 apple trees covered with scale and a few Kieffer pears dying of fire-blight. The land was well worked and the trees well trimmed and fertilized with bone and potash salts and with green manure. My troubles are the same as my neighbor's, *i. e.* fruit insects and fruit diseases.

I have found nothing but lime and sulphur wash to hold the scale in subjection and this treatment must be made annually. I have found nothing for the other troubles but non-effective "scientific literature." Right here I might add that in my experience our scientific friends claim too much. I have never been able to get the results they do, following minutely their directions, nor have I been able even with the advantage of wholesale markets to produce the washes and sprays at their figures, nor do the work in anything like the time they give.

In my opinion our present laws in the interest of the fruit growers are good but don't go far enough. The fruits are as important to this State as cattle or horses, but not nearly so well protected. If we are to rehabitate this State—a natural one for fruit with a profitable fruit-growing industry—more money must be spent and more effective work done by the State. We should have State-paid county superintendents with competent State-paid men under them, properly proportioned as may be necessary in each county by the State Experiment Station and the fruit troubles rooted out. Let the State own the machinery and treat the trees, and let the State pay an equitable price for the trees its agents for the general good destroy. To do this means money spent now, but it also means a good investment for the State—for good orchards mean an increased taxation, which will more than pay back what is spent now. This, in my opinion, is an absolute necessity or we must give up fruit growing. What good does it do if we spray, work or trim our trees if our neighbor is allowed to keep his diseased trees a perpetual menace to our fruit. The diseases we all know are from germs, many times more prolific than those affecting human and animal life, and fruit insects—we'll kill one and 10,000 will be around to attend the funeral of the deceased friend.

Scientific work and scientific writings are good, but these must be followed up by practical work, compulsory work by the State and if effective, at the expense of the State.

As an offset for the money I suggest the State put into this exterminating business, a moderate charge could be made for doing the work of spraying, trimming and removing the trees and these charges like taxes, made a lien on the land until paid.

Nature has given Maryland soil for fruit; we have the climate and we are geographically situated for a great fruit-growing State, but at this time we need active assistance and you, gentlemen, through your members in the legislature, should use every effort to get that assistance from the State.

I will close by calling your attention to two significant facts—*i. e.*, that during one week in the past December 231,000 barrels of apples were exported from this country, none, or very few, were from Maryland, and that while there is a large and increasing demand for fruits abroad we do not export one per cent of what we raise.

DISCUSSION.

President Kerr: I just wish to say for myself that there is one thing in this report that strikes me very much. I have educated myself from youth up to believe religiously that about all the drudgery in this world is located on a farm. Most people locate themselves in the city so as not to meet with the drudgery of farm life and here is a gentleman who gives up, as he says, the drudgery of city life and moves to the country.

Col. Powell: Not long ago, Mr. President, I saw an advertisement of a business college of this city—"Quit the drudgery of farm life and come to the city where positions are open paying remunerative wages." This advertisement made me fighting mad as it was most deceptive. To talk about drudgery or sameness on the farm is all fallacy; every hour brings changes and every day different work.

The city life is a drudge from early morning to late evenings, with exact keeping of hours which is most wearisome.

After trying both the city and the country, I am sure that there is not any farm in the United States where a man, putting his whole heart in the work, does not produce real pleasure greatly in excess over city occupation. Did you ever think that the city man knows very little of the ever-changing, always interesting growth of grain, animals or fruit?

I thank God I can live in the country. While regular money may not come every Saturday night, neither do the regular board bills and many other expenses incident to city life. We of the country get the health and nature in all its various, bounteous and beautiful phases as an offset to what some people call drudgery which is not drudgery at all, simply lack of interest which always causes unrest and seeming hardships whether in city or country. I hope our young men will think of this, and more of them take to agricultural pursuits.

President Kerr: Any further remarks. I do not wish to indulge any more.

President Silvester: I think we are satisfied.

MONTGOMERY COUNTY.

C. R. HARTSHORN.

Mr. Chairman: Our fruit season this year has been like that in other parts of the State. The apple crop was unusually large, and the quality was fairly good. On account of lack of a good season and care our peach crop was an absolute failure, also the plum crop. The strawberry crop was a full one, but did not bring as good returns as usual, but it was a fairly prosperous year, and is going to be more and more so and better in our county. In the Colesville district in the northwest, the Tennessee Prolific and Gandy are chiefly grown as market berries. The pear crop was comparatively a failure, and also the cherry crop. The birds got nearly all of the cherries.

Montgomery County is rather peculiar as compared with Caroline and several others. We can raise almost anything and, like people in the tropics, don't take as much care as we should. Our land is corn and wheat land, and most wonderfully adapted to fruit growing. People get along so well that they do not feel it necessary to work hard. But they are becoming educated to the necessity of doing it, and Montgomery County will, as soon as the people make fruit growing as much a business, and give it as much care and work, as hey do corn and wheat, have a very much better showing to give o the rest of the State. We have splendid land for red apples. Our red apples are as fine as the New York apples. When we come to the Washington market and the Maryland market they are quite low, and we get only one-half of what the New York apples bring. We have too many imperfect ones and we do not pack, ship and select them as the New York people do. If this had been done, I could have gotten the best of prices.

We have also, in the upper part, as fine peach land as Western Maryland has. We have the highlands suited to the mountain peach. We need only the man to take hold of it. It used to be quite thickly covered with peaches. No one gets peaches now except for family use. The yellows has killed most of the peaches. If we can get two good crops of peaches, it pays very well to plant peach trees, and all we have to do is to plant, grow them a few years then dig up and burn.

The ravages of the San Jose scale have been slight and while it occurred in places a few years ago, it has practically died out. The lady bugs were thick. I think the solution of this question is the lady bug, outside of the spraying. It will keep the pest down. These insects, where you have the food for them to feed on, will come to eat it, I believe the time is coming when the lady bug will be the salvation of the farmer. I do think we need have no fear in our county if reasonable treatment is made.

We can raise as fine apples, peaches and plums as any other place in the country. As fine in appearance as those from California and Michigan, and as fine in flavor as any. All we want is to be inoculated or sprayed with some of that mixture our Chairman sprayed with. As soon as that is done, we can raise it all.

PRINCE GEORGE'S COUNTY.

DR. E. P. MAGRUDER.

The past season was an off-year for peaches, pears and cherries because of the freeze at their time of blooming. Consequently the scarcity of these fruits created a strong demand and the very small crop, developed largely from delayed buds, sold at excellent prices on the Washington market.

Apples were unusually plentiful, some trees yielding as many as twelve barrels, and, considering the bulk of the crop, brought fairly good prices, from $1.00 to $2.00 per barrel for summer and fall varieties.

Strawberries, blackberries, raspberries, currants and gooseberries were also remunerative.

Leaf-curl was less conspicuous than the year before; leaf-blight was more abundant, while fruit rot, because of excessive rains, was generally prevalent, and in many cases beyond the control of the growers. This was particularly noticeable upon the peach and plum.

The rapidly-spreading San Jose scale is creating general alarm. Some contemplated planters abandoned the idea, others have grubbed up their orchards and planted the land to different crops.

Our only salvation lies in the strict enforcement of the law affecting these conditions, for spraying will certainly hold the scale in check and at least curtail its broadcast dissemination. To temporize is to encourage. It is the story of a handful at present infected destroying a thousand, as yet free, in the near future. I feel it the bounden duty of each of us, to himself and to his neighbor, to keep his own trees healthy and to see that his neighbor returns the compliment. It is well enough in theory that the large grower is compelled from sheer self-preservation to spray his trees, but it is exceedingly unjust in practice that this great expense, yearly increasing because yearly made necessary, should be forced upon him by a handful of neglected trees of his neighbor, whose loss, when total, is relatively nothing. This remark carries with it nothing personal. It is not an individual case at all. I speak for the many of my county who have appealed to me during the past season. The remedy lies in a generous co-operation of every man, woman and child who is interested in the life and existence of our beautiful fruits, and I trust that the matter will be thoroughly discussed at this meeting and profoundly deliberated upon before any milder application of the law be suggested.

SOMERSET COUNTY.

F. E. MATTHEWS.

As Vice-President of your Society for Somerset County, I respectfully submit my annual report. I have had to consider an odd year in more ways than one. The climatic changes were remarkably sudden and severe and were very disastrous to the fruit industry in this section and the remarkably warm days of spring coaxed our fruit trees and berry plants into bloom only to be killed by the cold in a day or two afterwards. This process was kept up so long that our fruit crop, with few exceptions, was wiped out.

Our strawberry crop was the shortest ever known in this section, some fine looking patches being only picked a time or two; others that I know of not being picked at all; such a condition as this was never before known here. The prices received for our berries was not as good as the short yield led most of us to expect. This being, no doubt, caused by inferiority of our fruit, as there were many berries hard sided and knotty from frost. Johnson's Early seemed to have suffered more than any others, although Excelsior was badly hurt as was also Hoffman. A berry called Superior seemed to be the best paying variety grown in this section the past season. It is a fine, large, good colored, good shipping berry. In some way it escaped the worst effects of the enormous frosts, and the few growers that were fortunate enough to have them had a fair crop and realized handsomely from them. This berry commences to ripen a few days later than the Hoffman and continued to pick up as long as Gandy and brought as good prices as this old standby. I have great hopes of this variety as it is a rampant grower making plenty of large, strong plants, and so far has been free from disease of any kind. A variety called Lady Gorrissen was introduced from New Jersey fruiters here for the first time the past season; the reports on its behavior are very conflicting, some growers liking it fairly well; while others found it of very little value. In my case it was practically worthless. I think the land I had it in was too sandy, and at the time of ripening it was very hot and dry. The vine also rusted badly and all the fruit that I sampled was of poor quality. Although I am not favorably impressed by this variety and would not advise planting it largely, yet I planted in heavier land this year and hope that I may be able to give better results of it in my next report.

Blackberries and raspberries were a poor crop with me, weather conditions being responsible for failures. Very few were raised in this section.

The peach crop was a very short one, most varieties being entirely bare of fruit. I had about 10 per cent of Troth's Early, 10 per cent Stump, Salway and Smock, 50 per cent Heath's Cling, 75 per cent Crawford's Late. This fine old peach has proved to be the best paying variety I have. Elberta has been a good second, but my orchard of this variety was entirely killed out by the scale. I found the bodies of these trees to be alive and last spring I cut the dead tops out and burned them; the bodies budded out in the spring and made a fine large growth the past season. I thinned the branches out and they made an average growth of five feet and are full of fruit buds; not a sign of scale on either old or young wood. I expect to spray this winter with lime, sulphur and salt wash. The net prices received for my peaches this season would have been exceedingly remunerative but for heavy freight charges. I shipped my entire crop (with the exception of enough to supply local demand) to one firm in New York City.

Japan plums, as a general thing, were a short crop. I know of one large orchard near me that bore no fruit at all; the varieties were Burbank, Abundance and Orgon. My orchard of Abundance and Burbank bore 75 per cent of a crop; other varieties a short crop. I find it necessary to get a crop of Japan plums here, that the trees be well cultivated and sprayed. I also find this plum crop to be one of the best paying crops I grow. The fruit is extremely popular here for preserving and canning. My orchard consists of our hundred nine-year-old trees and has not failed to yield paying crops since three years old. I generally sell my entire crop locally. My varieties are mostly Abundance and Burbank. I like the Abundance best.

The Kieffer pear crop in this vicinity was like the fruit crop generally—short. I had 50 per cent of a crop on my trees which bid fair to have made as many baskets as if the trees were loaded, owing to increased size, but for a heavy windstorm in September this would no doubt, have been the case. This storm almost stripped the trees of one-half or two-thirds of their fruit. I marketed my whole crop, however, which netted me two dollars per barrel. Other varieties of pears were an entire failure, about 10 per cent of Seckels, Bartletts, Duchess and Le Conte were without any fruit to speak of The late frosts and blights were mostly responsible for this, although some damage was done by scale.

The prospect for a crop of winter apples was the most promising for several years. This prospect was dissipated by the September blow, which almost stripped the trees. Most of the fruit blown off was unfit for any other use than for making cider and brandy; most of the cider, however, being kept for vinegar. This will cause a glut in the local market for some time

The trucking interest was fairly profitable, although in some sections of the county, the early potato crop and tomatoes for canning purposes were badly damaged by heavy rains The crop of late potatoes was also very badly damaged by some cause. There is a section of this county off from the rivers that is badly drained. The land generally is good, but the lack of proper drainage makes a crop of any kind uncertain in a season like the past. I am informed that the drainage could be easily accomplished as the fall is good. It is a pity some way could not be devised to remedy this. The owners in this county do not feel able to shoulder all the expense, which would be heavy. I think if the county would bear part, the work could be accomplished and it would surely pay in the end.

The early potato crop, although only about two-thirds of a crop, on the average, paid well. I sold my entire crop for $2.75 per truck barrel F. O. B. here. Sweets were profitable also, the early crop sold for high prices, the later crop was mostly taken by the canners at $0.85 per barrel. This looks like a small price, but will pay one hundred dollars per acre, the canners taking anything like a potato; from thirty to fifty hills digging a barrel.

The corn crop on river land was the best for years; but was very poor in the lower sections. The wheat crop was almost an entire failure throughout the county. The damage was caused mostly by fly and heavy rains at the time of blossoming. Hay gave about half a crop. Alfalfa does finely here. I cut mine five times this season and housed all the cuttings in prime condition. I think this hay will soon be largely grown here, as it certainly makes fine feed for all kinds of stock. Farmers, as a rule, were not so prosperous as last year.

TALBOT COUNTY.

DR. CHARLES LOWNDES.

Growing fruit for market in Talbot County for the past ten years has declined in a marked degree, and at this time there are few orchards of any size remaining. Our peaches and other fruits compare favorably with those grown in any other part of Maryland. Low prices and high freight charges have discouraged all fruit growers, and we often found our shipments brought us into debt. We are now growing more vegetables for the canners than in former years, for we then know the prices when we make our contract. And we find it much more profitable than fruit growing. Tomatoes last year was a good paying crop, and the returns were satisfactory to the growers. Corn and tomatoes are the only vegetables that the canners want.

Apples, if properly cared for, will do well in this county There are few young orchards and the old ones are much neglected. I find that apple orchards, should be frequently cultivated in the same way as we do our peaches. Apples will remain longer on the trees and will grow to a much larger size by cultivation; and, by all means, thin the fruit. Late varieties are the kind to plant. I find Fallawater and York Imperial are the best varieties; the Fallawater the canners like and the York Imperial for winter. If I were to plant an orchard of one thousand, eight hundred would be York Imperial. I keep my apples for winter this way: When I gather them in November I make small piles of straw about two feet deep and four feet in diameter under the trees in the orchard; in the centre of each pile I put five peach baskets of perfect apples, then cover the apples with two feet of straw, then cover the whole pile with five inches of dirt. The secret of keeping apples, is to keep them dry and at a regular temperature and exclude the air. Be sure to have plenty of straw, or the apples will have an earthy taste. I find they keep in this way as well as they do in cold storage and remain perfect about the same time after being removed. I have found that more than five baskets in one pile will not keep as well.

Figs do well in this county, frequently bearing two crops. Strawberries and other small fruits did well with us last year, but are only grown for the local markets. We have no fruit crops more certain than grapes, all varieties do well and a failure almost unknown. Cherries, as a rule, are not a success. Spraying has been very little used in this section. San Jose scale is spreading more every year.

WICOMICO COUNTY.

W. F. ALLEN.

The fruit and vegetable business of Wicomico County is fast growing important. About the only orchard of peaches on the Peninsula the past season bearing a full crop, was in this county, and will tend no doubt, to largely increase the planting of peaches here. The tomato industry is enormous; hundreds of acres being planted for canning, and quite a good many acres for Northern shipments.

The cantaloupe industry here is, no doubt, carried on to a larger extent than any part of the Eastern States north of Georgia. The soil here being especially adapted to the crop, it can probably be grown more successfully in this county than in any other section of the Peninsula.

Watermelons also receive considerable attention; many acres being grown for shipment. Several car loads daily being shipped from the different stations along the line.

Sweet potatoes can be grown as successfully here and of better quality, perhaps, than in the famous sweet potato district of the eastern shore of Virginia. The soil is especially adapted to this vegetable, and it can be grown in large quantities, producing immense yields of the highest quality. In fact, potatoes shipped from this section the past winter sold for prices comparing very favorably with the famous Vineland, N. J., product; and I have no doubt the quality was fully equal to it.

White potatoes, also, are receiving considerable attention and where one barrel was being shipped a few years ago, fifteen or twenty are now taking its place.

Though but little attention has been given to the crop, beets for bunching and shipping, or for stock feeding, grow here to perfection, and will, no doubt, sometime in the near future, be much more largely planted than at present.

Cabbage would be an important product, and, in fact, is grown to a considerable extent, notwithstanding the ravages of the harlequin bug, which we find to be the worst of all insects, as nothing seems to hurt it. The only remedy is to pick it off and kill it by mashing.

Some attention is being given to cucumbers, and a very fine product can be grown here; as its requirements are similar to the cantaloupe it can be grown here with equal success.

Onions, which have scarcely been known here previous to two or three years back, are now grown to some extent for market purposes, principally from sets. Our soil seems to suit this vegetable, and it can be grown to perfection. It has not been thoroughly demonstrated yet, as to whether we can grow successful crops the same season from the black seeds, but this is receiving some attention and will, no doubt, soon be tested out whether or not they can be profitably grown in that way.

Many of the other vegetables also are being given some attention. Almost all kinds growing to perfection under intelligent management and proper care. When the possibilities of our Peninsula become known, outside people are bound to flock here in great numbers, as there are but few sections as favorably situated all things considered, for the profitable growing of all kinds of fruits and vegetables, as here.

WORCESTER COUNTY.

ORLANDO HARRISON.

Our county, bordering on the ocean and the waters of the bays, with fish and oysters, as well as fruits and vegetables, one would naturally ask, "What more do you want?" What we need to improve conditions is labor with more push and grit and that is willing to be directed.

In our county we have a great variety of soils, from the live sands on the beach to the deep rich, red clay soil that produces a good yield of corn, wheat and hay. In the agricultural line, corn is grown and used in the county. Wheat is grown successfully—the yield being from five to forty bushels per acre, averaging probably twelve to twenty-five. We have one farmer who grew sixty-five bushels of corn per acre last season. The red clay soil and the white clay subsoil land, if put in good condition and improved, grow good crops of hay, from one-half to three tons of timothy per acre.

There was a considerable quantity of cow peas, sorghum, millet and corn grown last season, owing to the short crop of hay. For our own teams, we grew from seventy-five to one hundred tons, principally of sorghum, and some plots of cow peas, sorghum, millet and corn were sown together. We prefer the sorghum alone or the cow peas and sorghum, and our teams, about forty horses and mules, are fed on that.

Oats are less grown than years ago. Rye is sown in small quantities for early spring pasture. Crimson clover is always ready in some form or another. We sow crimson clover in our nursery at the last cultivation of the trees in September to have a cover crop on the land, and have found it to be of much advantage to the soil, yet at times, it has been expensive for early spring, hoeing out the clover. To improve the land, if you have the time, cow peas lead all, followed in fall with crimson clover. We should pay better attention to improving our soils with cover crops.

Growing white potatoes has been quite successful, when properly handled, and there was considerable increase in acreage and a marked increase in yield per acre. A field grown in potatoes, puts land in most excellent condition for wheat for fall or strawberry plants for spring.

Growing berries will receive better attention. Just north of us they have been securing refrigerator cars and it has been shown to our people that we must grow more berries at one point to get the buyers there and make a market at home. Probably the best early berry grown is the Excelsior on light soil, while the best late one on low, rich, well drained soil is the Gandy—these are the tested varieties. The berry crop, as a whole, was very satisfactory last season, and an increased acreage will be planted.

But few peaches are grown in our county, yet there are some spots of excellent peach soil, where the tree grows to perfection. I believe there are some Late Crawford trees forty years old, which are healthy and bear fruit in abundance.

The best summer apples here are the Red June, Yellow Transparent, Red Astrachan, and the best winter apple is the Winesap, yet other varieties are planted as well.

Weather conditions had their effect on us last spring, it being very wet until in May when it stopped raining and was extremely dry for about seven weeks, causing the soil not to be cultivated as it should, after which it was quite wet all the growing season.

Our field of strawberry plants has made an excellent growth by the early fall rains. To meet the increased demand of apple trees, we planted with spades, more than three million of whole root apple grafts, and the States north of us, calling on our labor, caused us to go South to the industrial agencies to get men and women, and while all of them have not stayed with us, there were good ones among them, and I would recommend this method to the neighboring counties when in need of extra labor. With our immense plant of peach trees and other stock, we found the only thing to do was to find more people who would use the spade and hoe.

Summing up the whole situation, I believe we will have to grow less acres, prepare the soil better, learn to use more machinery in preparing, plant on time, cultivate thoroughly, study economy in using less labor and have a personal supervision over every acre of corn, wheat, hay, trees, vines or plants grown.

Reports of Standing Committees.

ORCHARDS.

A. L. TOWSON, CHAIRMAN.

This is really a sectional report as Mr. Harris of this Committee is not able to be with us. However we will try to report as it seems to us in Washington County.

The intimate relations between the orchard conditions and the weather, makes a report on the latter necessary to understand the success or failures for a good condition of orchards. The winter of 1902 and 1903 was a mild one with a severe freeze in February, which caused the partial loss of some varieties of peaches. A drop in the thermometer to 20 and 22 degrees, when the trees were in full bloom, caused an almost entire failure in Washington County, with few exceptions. The exceptions were those that had been given good culture or were protected from the cold west wind. The spring opened wet which delayed cultivation and was followed by a drought which lasted until the middle of May. The balance of summer was unusually cold and wet. The peach leaf curl, mildew and rot were very prevalent. The wet weather interfered with the cultivation of the orchards, especially on low grounds; those which on higher and lighter ground were cultivated look well. This is more especially shown on trees set last spring. The bearing trees have made a good growth, but it is well proved this year, that no amount of moisture will take the place of good culture. San Jose scale is very abundant and spraying cannot be longer delayed, if orchards are to be saved. Good results are shown where trees were thoroughly treated. The apple crop was large and of good quality. The wet weather of June, July and August threatened a serious loss from mildew, but apples on higher ground and those sprayed were not affected.

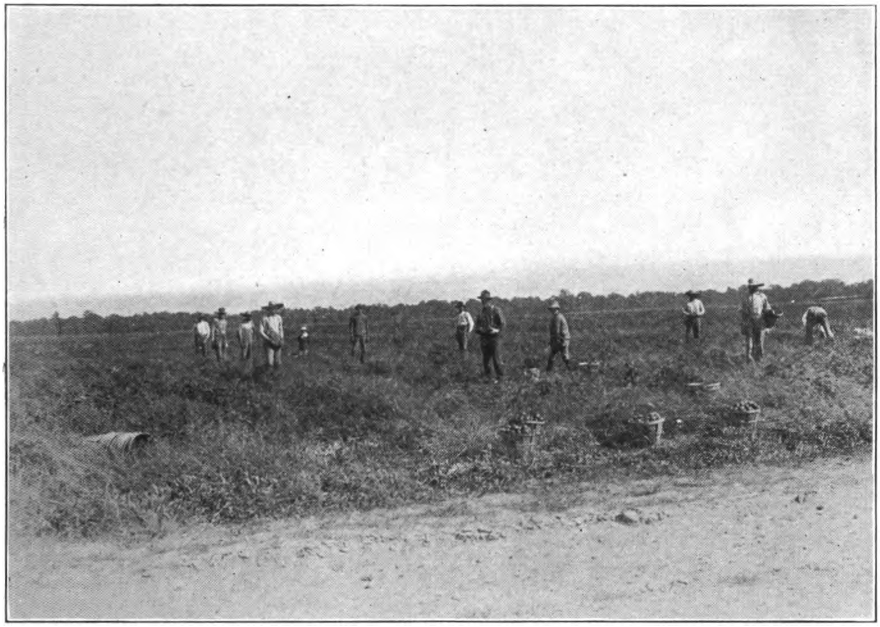
DISCUSSION.

MR. BALDERSTON: How was the cherry crop?

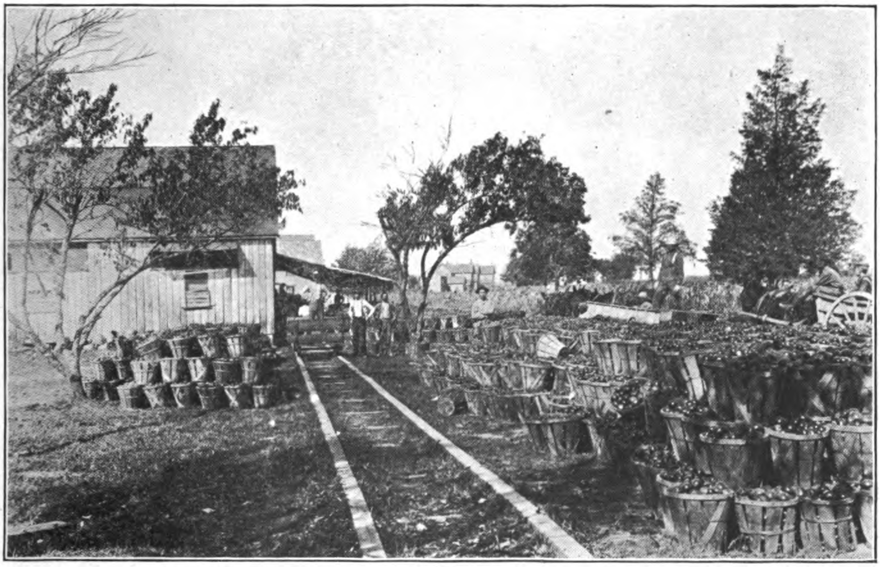
MR. TOWSON: The cherry crop was very light.

MR. BALDERSTON: If there are not enough cherries to feed the birds, the raspberries and other berries suffer. Cherries were not enough this year to go around and our raspberries were attacked before they were ripe.

MR TOWSON: The same condition prevailed with us. We did not know when they were going to stop.



Tomato Picking, Caroline County, Part of Over 100-Acre Field.
(Photographed by Prof. C. F. Austin).



Portion of Tomato Cannery, Caroline County.
(Photographed by Prof. C. F. Austin).

A Member: The robins, gentlemen, could never live without effecting the berries.

STONE FRUITS.

DR. E. P. MAGRUDER, CHAIRMAN.

Under the head of Stone Fruits fall usually the Almond, Nectarine, Apricot, Cherry, Plum and Peach. Since our climatic conditions are unfavorable to the growth of the Almond, we may pass rapidly to the consideration of the more important members of our group.

The Nectarine.

As popular favor is on the side of her twin sister, the peach, the nectarine is given little attention commercially this side of California. It is a curious fact, but one now well known, that the nectarine may come from the seed of the peach or a peach from the seed of the nectarine. Though usually inferior in quality to the peach and more liable to the attack of the curculio, the nectarine will thrive anywhere that is suitable to the growth of her sister fruit.

Little attention has been given to the breeding and selection of varieties and perhaps it is largely due to this fact that they are not more widely cultivated.

In color, size, and season the nectarine varies like the peach. The white-fleshed type is more grown for canning because it does not color the syrup.

The most popular varieties of nectarine are: Boston, Downton, Hardwick, Early Newington, Pitmaston, Orange, Stanwick, Humboldt, Lord Napier, Advance and Elruge.

The Apricot.

Apricots are of three species, all perhaps natives of China or of Japan. These are:

I. *Prunus Armeniaca*, or common European-American group, of which the Russian apricot is but a smaller fruited, hardier offspring.

II. *Prunus Mume*, or Japanese type, valued at home more for its flowers than for its fruit.

III. *Prunus dasycarpa*, purple or black apricot, rarely cultivated.

It is not generally known that the apricot tree is as hardy as the peach tree, and that it will thrive under like climatic and cultural conditions, except that it requires richer soil.

Although grown commercially in New York and other eastern States, there are several reasons for the apricot's relative obscurity in our part of the country, namely, ignorance as to its culture; loss of crop because of its early blooming season; ravages of the curculio; and uncertainty on the part of nurserymen as to the best stocks upon which to bud it. With a little more attention on the part of the grower and of the nurserymen to propagate hardier varieties, I believe all these objections will be silenced, and the apricot will be found in the same circle with her more favored sisters, the plum and the peach.

SOIL, CULTURE AND PRUNING.

The best soil for the apricot is one that is deep and dry, and of a loamy or gravelly character. The orchard should be upon elevated land, with north or northwest exposure, and, preferably, near a large body of water, as under these conditions blooming is retarded and the early spring frosts are less severe. A wet or retentive subsoil means certain failure. The same cultural plan as applied to the peach is appropriate for the apricot with this important difference, that the cultivation should cease earlier in the season, that the new wood may thoroughly mature and the buds harden. Pruning should be heavy and essentially that for plums.

Under favorable conditions the apricot is as productive as the peach. Severely thinned it becomes an annual instead of a biennial, bearer.

THE CURCULIO.

As arsenical spraying is uncertain, the deadly enemy of the apricot, the curculio, must be controlled by the system of jarring used in plum culture, but even more thoroughly and persistently done. It should be begun as soon as the blossoms fall and continued as long as the insects are sufficiently numerous to do injury—usually from three to six weeks, and two or three times or oftener a week. This should be done in the early morning when the curculio is chilled and indisposed to fly.

As only the best fruit growers have succeeded with the apricot in this section of country, it is regarded as a distinctly fancy fruit, and as such should be handled in small, tasty packages.

In California a moderate estimate of the yield has been placed at seven and one-half tons per acre. There is great demand for this fruit in its fresh, canned, dried or crystallized forms throughout the United States, in England and on the Continent as well—the result of California's magnificent showing in this one product. The success achieved in the Alameda and Santa Clara valleys has resulted in the planting of over three million trees, occupying upwards of forty thousand acres of land. The canned product in 1895 reached 360,000 cases, each containing two dozen 2½ pound cans. In 1897 she shipped 177 car loads of fresh apricots out of the State and realized from the dry product remaining 30,000,000 pounds.

VARIETIES.

The varieties highest prized in the eastern States and named in the order of ripening are: Harris, Early Moorpark, St. Ambroise, Turkish or Roman, Montgamet, and Late Moorpark. The best of the Russian type are: Alexander, Gibb, Budd, Alexis, Nicholas, and Catherine. The favorites in California are: Newcastle, Royal (numbering three-fourths of all the trees in the state), Blenheim, Hemskirke, and Moorpark. Though a shy bearer this last in size and lusciousness is said to be the best apricot in the world.

The Cherry.

Our cultivated cherries are probable descendants of two European species, *Prunus Avium* and *Prunus Cerasus.* The former is characterized by a tall, erect growth; fruit red, yellow, or black, generally sweet; form spherical, heart-shaped or pointed; flesh soft or firm. The latter is known by its low head and spreading habit of growth; fruit light or dark in color, sour, less heart-shaped in form.

The four representatives of the *Prunus Avium* or sweet cherries in the United States are:

I. Mazzards or inferior seedlings. They are long-lived and attain to great size. The largest of this type I ever saw grows upon the Delaware-Chesapeake peninsula.

II. Hearts. These are heart-shaped, soft, sweet, light or dark in color, as seen in Governor Wood and Black Tartarian.

III. Bigarreaus. These are white on one side and red on the other or mottled, firm, as seen in Napoleon and Windsor.

IV. Dukes. These are light-colored, more acid than the above, represented by May Duke and Reine Hortense.

The two representatives of the *Prunus Cerasus* or sour cherries are:

I. Amarelles, light, with colorless juice, as seen in Early Richmond and Montmorency.

II. Morellos, dark in fruit and juice, as seen in the English Morellò and Louis Philippe.

SOIL, PLANTING AND CULTIVATION.

The best stock for both sweet and sour cherries is the Mazzard, as it produces a better root system, stronger union, longer lived and sufficiently hardy tree. The Mahaleb, a European type, is in more general use for the sour cherries because of its greater ease to bud and its freedom from blight in the nursery.

Our State is adapted to the growth of the cherry, both sweet and sour. It thrives best on a light, dry, loamy, retentive, elevated soil. The sour kind, since they need more moisture, will thrive in heavier soil.

Sweet cherries are best planted thirty feet apart each way; the sour kinds eighteen feet. Trees two years from the bud are usually selected for planting. They are headed two feet from the ground, cut back thus to promote low vase-form branching for two years, the sweet to outside buds, then allowed to make long branches. Thrifty trees will stand severe pruning much better than is generally supposed.

Shallow cultivation, begun in early spring and continued at intervals of ten days or after every rain until the middle of July, then seeding to cow peas or crimson clover at the last cultivation, are, perhaps, the best methods with us. Extensive nitrogenous manures are to be avoided. Sufficient nitrogen can be secured by the legumes above mentioned; potash in the form of the muriate, 150 to 300 lbs.; and phosphoric acid 300 to 500 lbs. per acre will usually produce excellent results.

Success in cherry culture depends upon careful handling, variety, and market, but more upon the individuality of the grower. Gatherers of the fruit should be cautioned against breaking the spurs. Picked, always by the stems, ripe or a day or two before, especially if brown rot threatens, the fruit should be faced in small, attractive baskets and these packed in crates. Remember, the choicer the fruit, the more carefully it is handled, the higher always the price.

The profit in sour cherries ranges from $30.00 to $100.00 per acre; that for sweet from $50.00 to $300.00.

Among the sour cherries the lighter colored, milder Amarelles are now more in demand both by canners and consumers than the darker colored, more acid Morellos. Although I should not be surprised to see the current of favor turn shortly toward the white Bigarreau, the most profitable now among those of this type are the firm-fleshed red or dark.

Of sour cherries the best varieties, named in order of ripening, are: (Amarelles), Early Richmond, and Montmorency; (Morellos), Ostheim, Louis Philippe, and English Morello.

Of the sweet cherries those highest esteemed among the Light Bigarreaus and Heart are: Napoleon, and Black Tartarian. Of the

Dark Bigarreaus the most profitable are: Robert Red Heart, Mezel, Windsor, and Dikeman.

The Plum.

Perhaps no other country in the world presents a plum flora so complex as that of the United States, for we grow not only the definite types of Europe, continental Asia, and of Japan, but also a species of no mean importance that are peculiarly our own.

While any classification is largely arbitrary we may group our cultivated plums under the following types:

I. *Prunus domestica*, or European, originated in western Asia, such as Green Gage, Lombard, Bradshaw, Damsons. The commercial plum of the Pacific slope and from Lake Michigan eastward and north of the Ohio, together with the recent hardy introductions from Russia, are of this type.

II. *Prunus cerasifera*, Myrobalan or Cherry-plum type, indigenous to southeastern Europe or southwestern Asia. These are mostly used for stocks. The Marianna, so frequently used for this purpose, is either an offshoot of the Myrobalan, or a hybrid between it and one of the native plums.

III. *Prunus triflora*, or China-Japanese type. Introduced from Japan into California about 1870, it seems generally adapted to the United States, north as well as south, as seen in Abundance, Berckman's and Chabot.

IV. *Prunus Simonii*, Apricot or Simon plum. It is native to China, but, while widely disseminated, is little grown except in California.

V. *Prunus Americana*, or American type. This grows wild in the north, westward to the Rocky Mountains and southward to Texas and the Gulf. It is splendidly adapted to climatic conditions too rigorous for the Domesticas.

VI. *Prunus hortulana*, or Wild Goose type. This is probably a cross between the Americana and the Chickasaw types, as seen in the Wild Goose, Milton, Miner, Whitaker, Mrs. Cleveland, Smiley and Golden Beauty.

VII. *Prunus augustifolia*, or Chickasaw type. These are grown from southern Pennsylvania to the Mexican Gulf, as comprised in the Newman, Munson and Lone Star.

VIII. *Prunus Watsoni*, or Sand plum. It is rarely cultivated outside of Kansas and Nebraska.

IX. *Prunus maritima*, or Beach plum. These are represented by the unimportant Bassett's American, as seen along the coast from New Brunswick to Virginia.

X. *Prunus subcordata,* Pacific coast or Sisson plum. They are rarely seen outside of Oregon and California.

The Japanese varieties are advantageous in that they ripen early, are firm and therefore carry well. The trees are vigorous and very prolific and are less liable to injury from black-knot and the curculio than are the Domesticas.

The Americanas possess the great advantage of hardiness and less susceptibility to fruit rot over both the Domesticas and the Japanese. They, too, are early and prolific bearers, so that severe thinning is a necessity. The shot-hole fungus and fruit-rot common to these must be controlled by Bordeaux. They are awkward growers and do best under light pruning, given during the first few years' growth, directed to an open head and few main branches for form.

The Wayland group, as seen in Wayland, Golden Beauty and Moreman, are valuable varieties for late market.

The Wild Goose group, as seen in Wild Goose, Milton, Wooton and Whitaker, are especially adapted to our Maryland latitude and profitable for market. They are grown on Myrobalan, Marianna, or peach stocks. If peach stock is used, the union should be whip-grafted on the peach root; since if the peach stock is above ground it becomes a prey to the borer. It is to be remembered, however, that with few exceptions these plums do not assume naturally a good form, that they are much subject to shot-hole fungus, which frequently strips them of foliage in mid-season, and that they are thin-skinned and liable to crack when ripe, particularly in wet weather. They are picked on this account when at full size rather than when full ripe. As the Chickasaws, which bloom at the same time, are very effective cross-pollinizers of this group as well as of the Japanese, a few of them like, Munson, should be planted in the Wild Goose block. It is well to remember the great importance of bees for this work also.

SOIL AND STOCKS.

While the plum will thrive on a variety of soils it grows best upon a clay loam. The Americanas do well in a rather moist soil, and respond favorably to mulching.

While the Myrobalan serves as a stock upon which most plums are budded, some varieties overgrow the bud and sprout from the ground. Hence the ideal stock for Domesticas from the growers' standpoint is the Domestica itself, though more difficult to secure and more liable to leaf fungus in the nursery row. For sandy soil the peach stock is probably best, though the Lombard and French Damson do not take well on this stock. The peach is the usual stock of the Japanese plums. The slow and crooked growing varieties are best top-grafted or budded upon the Lombard. In the north the Americanas are best when worked on their own seedlings, although commonly budded on Marianna in the south.

PLANTING AND PRUNING.

For planting trees two years from the bud are usually selected, although with the more vigorous varieties year old trees give excellent results. The average distance apart for planting is about eighteen feet, though many successful growers prefer them closer one way than the other, say 18 to 20 feet by 8 to 12 feet, cultivation eventually ceasing in one direction. Native plums can be planted closer together than those of foreign importation, about 12 to 15 feet apart. On account of the tendency to late summer growth the cultivation of the orchard which should be thorough and persistent and never seeded to grass, should cease not later than July 15th.

Medium fertility of soil, not too rich and not too poor, will give best results. The necessity of deep and thorough preparation of the land before planting to trees cannot be too strongly emphasized.

PRUNING.

Usually the pruning of plums is like that for apples. Perhaps the low-headed vase form tree is prettiest. The head is best started low, the limbs beginning about three feet from the ground. Three to five of these make the platform with sometimes the central leader—especially among those less inclined to upright growth—allowed to continue for form. The Japanese and Americanas fruit both upon spurs and the annual axial growth, and therefore suffer less from the loss of their spurs than occurs in the case of the Domesticas, upon the spurs of which the fruit is very largely borne.

DISEASES AND INSECTS.

The black-knot is best controlled by cutting it out, for this purpose systematically going over the orchard during the summer and again as soon as the leaves fall.

The leaf-blight can be held in check by thorough spraying with Bordeaux mixture, weaker than the strength for apples, especially on the Japanese type, when the buds swell and two or three times afterward during the summer.

To control fruit-rot, avoid in the first place the cultivation of the more susceptible varieties, like the Lombard, pick off and burn the mummies of the previous season, thoroughly spray with Bordeaux, and thin the fruit so that no two specimens are in contact with each other. The value of this last I cannot overestimate, as its benefits have more than once been demonstrated in my Japanese groups.

For the curculio the jarring process, elsewhere referred to, is the best method for the control of this pest.

VARIETIES.

The best varieties is largely a local question. If the proposed planter will visit a successful orchard in his vicinity he will learn more about those best for him to plant than it is possible for any one at a distance to tell him, and I may say that this remark applies aptly to the planting of any fruits. In my Japan group the Red June and Willard are poor bearers, the Satsuma a poor seller, the Wickson entirely too tender in blossom, the Bailey a veritable feast for the brown rot, and the Abundance the only one from which any profit has been derived. Among the other types, Wild Goose has done fairly well and this last is held in high regard by those growing it in the lower part of my county. Asked this question of best varieties, a distinguished plum culturist of Maryland replied: "1st, Milton; 2d, either Whitaker or Wild Goose or both; 3d, Mrs. Cleveland; and 4th, as a pollinator, either of the following, viz: Smiley, Munson or Newman, named in order of preferment."

The Peach.

We may divide all peaches of North America into five general groups as follows:

I. *Peento*, or Flat Peach race; as seen in Angel or Waldo. This, like the second group, is probably a South China type.

II. *South China*, oval, long-pointed fruit, with deep suture near the base, represented by the Honey.

III. *Spanish*, or Indian race; very late, yellow, firm, often streaked, as seen in the southern varieties, Cobler, Columbia, and Victoria.

IV. *North China*, mostly cling or semi-cling, as seen in Chinese Cling, Belle of Georgia, Waddell, Elberta, Mamie Ross, Smock and Thurber.

V. *Persian*, common varieties of the mid-union and the north, as seen in Crawford, Old Mixon and Salway.

SOIL, SITE AND PLANTING.

Although the peach will thrive in many kinds of soil the best is that of a light, sandy character. Here it develops its highest color and richest flavor. Heavier lands, however, often yield fruit of larger size and more juiciness, but the tree tends toward delayed ripening and late growth of wood, both of which may be corrected by stopping the cultivation earlier and sowing the land to rye to be turned under in early spring. Broad open-top pruning will aid much also by letting in the sun to add color to the fruit under these conditions.

The ideal site for an orchard seems to be near a large body of water which equalizes thermic conditions and retards the warming up of the land in early spring. If inland, an elevated northern exposure is perhaps the best. The land should be plowed deep and subsoiled before planting.

The standard distance is 20 feet apart each way. Many growers, however, totally disregard this, planting as close as 13 by 13 or 15 by 15 feet, with excellent results. Severe pruning in such cases, with the nerve to grub out overcrowding trees, is, of course, a necessity, and, with few growers excepted, is not to be advised. The trees are set at the same depth grown in the nursery, and the earth heaped up four to six inches at the base to allow for settling and to prevent winter rocking. They are then cut back not more than 18 inches high, three to five shoots are allowed to start for the platform branches, and all other buds rubbed off. The young orchard is then planted to hold crops, like potatoes or tomatoes—corn is too exhaustive of the soil—and highly fertilized for the benefit of the trees as well as the nurse-crop. This may be continued for two or three years, after which the land should be given up absolutely to the trees. In planting, my own preference is for trees 3 to 4 feet high, straight and well-rooted. They are easier to plant than the larger trees, fewer will die in transplanting and they will live as long, bear as early and as much fruit as those 4 to 6 feet high. I use ground bone, two handsful in the bottom of the hole and four more mixed with the soil in filling it up, at planting.

TILLAGE AND FERTILIZERS.

Unless the soil be very rich, peach orchards should never be cropped after the second year, and if closely planted, it is best not to crop the land at all after the trees are set. The orchard is plowed both ways, 3–4 inches deep in April, thoroughly harrowed with an Acme harrow and this last continued every week or ten days, or after every rain, till about August 1st. It is then sowed to cow peas or crimson clover. Excess of nitrogen in the soil and late tillage are to be avoided. Wood ashes, stable manure on weak trees, muriate of potash, ground bone, and lime for its indirect effect; with cow peas, crimson clover or vitch for humus—are among the very best fertilizers. Dissolved S. C. rock mixed with muriate of potash is an excellent combination—600 to 1,000 lbs. per acre, broadcast, in winter or spring. Raw bone is perhaps better than S. C. rock, but more expensive. Wood ashes is very good but difficult to procure. A general basic formula of mineral fertilizers for fruit trees as given by Voorhees consists of 100 lbs. each of ground bone, acid phosphate and muriate of potash per acre, 300 lbs. thus should be considered the minimum, while a formula consisting of 12 per cent potash, 8 per cent phosphoric acid and 3 per cent nitrogen, applied 1200 lbs. broadcast per acre will be found none too much upon poor, sandy soil.

It is a good plan about June 1st when the ground has been thoroughly cultivated up to this time, to drill in 3 or 4 rows of cow peas between the rows of trees and 4 feet from them, and then to cultivate both trees and peas until the latter overlap and prevent further tillage. When ripe the peas may be gathered for next year's seeding, which should be across that of the first. The vines lying over winter upon the ground prevent soil leeching and are ready to be turned under for aeration and better tilth in the spring. This system, continued a few years, will save us not only the expense of the peas but also that for the most costly fertilizer ingredient, nitrogen, as well. Under methods here suggested I have trees, planted before I was born, that are still bearing good crops, though they are now thirty-two years old.

PRUNING.

There are three methods of pruning in general use among peach growers. 1st, short trunks with branches rapidly ascending for platform; 2d, high trunks with platform more horizontal; and 3d, the method of annually heading-back the season's growth. Each system has its ardent supporters and its equally staunch opponents, and the question is frequently asked, which is the best? A little reflection it seems to me would convince the fair-minded orchardist that no one is best under all circumstances. Each has its particular advantages, and disadvantages. Some growers think more of form than of fruit, more of the tree than of the peaches, and, after all, each one adopts that method which most nearly conforms to his ideal. I believe that the site of the orchard and the character of the soil should be our guide in this regard. It is evident that the long trunk would be adapted to rich land on elevated sites, because of excessive tree growth and exposure to wind storms. Upon sandy soil we may expect slow growth and hard wood; upon strong land, rapid growth and heavy, green tops—conditions which are exactly opposite to each other. Hence the absurdity of adopting the same method of pruning for both. It is a mistaken idea, too, that short trunks with forking branches are more liable to split when laden with fruit than the high trunks with more horizontal branches. The one point to observe is that your fork does not form a perfect Y, or that the branches do not start from the trunk at exactly the same height. The low trunk possesses the advantages of the broad head, ready access to pickers and spraymen, protection of body from sunscald and less liability to fungous disease. It is objected to because of the difficulties of close cultivation, but modern implements have largely overcome this.

High trunks afford perhaps a more shapely tree, but are grown primarily because of the relative ease with which they may be cultivated. They tend less to the sprawling habit from faulty pruning, and admit of severer heading-back—from ⅓ to ⅔ the annual growth.

But whatever plan of pruning may be adopted, remember the great commercial importance of the little side-shoots that put out from the main branches when the top is properly headed-back. These will often bear when all others fail. This work is best done early in the spring, all dead wood and weak branches are removed and the top kept open for sunlight and its effects upon color.

THINNING.

Peaches should not be allowed to remain closer than five or six inches apart on the same branch. Comparatively few small growers realize the immense advantages of this practice, advantages of higher price for the increased size, quality and quantity by bulk of the fruit, a vast saving of the vital energy to the tree, a stimulus to annual bearing, and a great economy in the labor of picking. A single peach from a properly-thinned tree will bring more money than three or four from its over-burdened sister.

Immediately after the "June drop," at the period of pit-hardening—the time of severe strain upon the energy of the tree—when the fruit is the size of small hickory nuts, about one-half inch in diameter, the work should begin. My men are instructed to remove all defective fruits, to select for removal the smaller rather than the larger-sized specimens and to leave a space of six inches between the fruits on the same twig.

MARKETING.

Remember that honestly, carefully and neatly packed fruit pays well for the extra trouble. This is true relatively speaking even in times of a glut. A small package of full measure, properly graded and of attractive appearance is what the buyers want and are willing to pay for. Six basket carriers for extra or fancy fruit, ⅝-bushel baskets for primes, and the 3-peck slatted crate for third-grade are in general use. The Climax basket, convenient in size and handling, is growing in favor, as the most careful orchardists are ever alert for a smaller, dantier package.

INSECTS AND DISEASES.

The borer is best destroyed by digging about the base of the tree in October and again in May with an iron trowel, determining by the exuding gum the presence of the worm and carefully cutting into the bark with a small penknife to expose and kill it. A wire probe is often used for the same purpose. Gas lime about the base of trees over a year old, a shovelful to the tree, or gas tar painted in the form of a band three or four inches wide, half above and half below the surface of the soil, are good remedies.

For San Jose scale the lime-sulphur-salt solution, where properly applied, seems destined to supersede all other remedies. The feature of this wash of especial attraction to the orchardist is the fact that when the tree and bud are dormant, contrary to its being injurious to either, like so many washes are, it is a real benefit to both, the tree subsequently assuming a more vigorous appearance both in wood and foliage. Investigation reveals the interesting fact that death is due less to a direct toxic effect upon the scale than upon the fact that its breathing spiracles are clogged by the solution, and the creature itself is imprisoned within a miniature cell from which neither it nor its generated young can escape. The wash slowly disintegrates the scaly covering and exposes the mature scale to the action of weather and predaceous insects. The larvæ cannot penetrate the thick coating to establish themselves until the rain has washed it very thin or entirely away.

From Lodeman I quote the following formula and method of preparation:

Lime (unslacked)	25-40 pounds.
Sulphur	20 pounds.
Salt	15 pounds.
Water	60 gallons.

"To mix above, take 10 lbs. of lime, 20 lbs. of sulphur, and 20 gals of water. Boil until the sulphur is thoroughly dissolved. Take the remainder—15 lbs. of lime and 15 lbs. of salt—slake and add enough of water to make the whole 60 gallons. Strain, and spray on the trees when milk-warm or somewhat warmer."

For yellows, "little peach disease," and rosette, the one remedy is extermination by grubbing up and burning the trees.

For leaf-curl a thorough spraying with full strength Bordeaux, just before the buds swell in spring, is a very effective remedy, followed, in case of wet weather succeeding the first spraying, by a second application after the petals fall, consisting of 2 lbs. copper sulphate, and 2 lbs. quicklime to 50 gals. of water. Where more convenient, crude petroleum of proper specific gravity and 15 per cent strength may be substituted.

For fruit-rot and twig-blight due to the fungus *Monilia fructigena*, all mummified fruit of the previous season should be gathered and burned; early in the spring *before* the fruit buds swell spray with copper sulphate solution, 2 lbs. to 50 gals. of water; when the buds *begin* to swell and again before they *open* spray with Bordeaux mixture; to prevent the discoloration of Bordeaux upon the fruit when it has reached full size, give it an application of copper carbonate, 5 ozs., (with enough 26° ammonia to dissolve it), to 50 gals. of water, which may be repeated in bad cases every week during the ripening period. Remember, now is the time of danger. The spores are mature and every wind is carrying them from the infected fruits to those as yet perfectly sound and about to net you a fair return for all your tireless care. Are you going to abandon the field now when the victory is all but won? Many of us will answer, "No, we will make this last charge!" but how many of us in actual practice do so?

COLD STORAGE.

Recent experiment has demonstrated that the freezing point of water, 32° Fahrenheit, rather than any point above or below it, is the best temperature for the storage of peaches. Picked when fully grown and highly colored though firm, rather than at any other stage, and immediately stored in this temperature, they have kept in excellent commercial condition for two to three weeks. After removal the fruit held firm for two or three days, depending upon the weather conditions at the time, and retained its quality. Later than this the quality deteriorated, though the fruit remained firm and bright for a month. The utmost care and dispatch, however, as to picking—preferably in the cool of early morning, wrapping, packing, transit, cold-store room, and finally removal into the hands of the consumer, must be exercised, for the closing days in the life history of the peach are occupied with rapid processes, both physical and chemical. With these precautions observed, it is possible to store peaches successfully for a short time.

VARIETIES.

American nurserymen catalogue over three hundred varieties of peaches. It would probably be far better if they reduced this number to 30. I myself have over one hundred varieties, which I think might profitably be reduced to 10. It is difficult, of course, to answer the question of best varieties. So much depends upon conditions of soil, elevation, air drainage and facilities for rapid dispatch to the centres of consumption. Generally speaking, I should say, stick to the standards yourself and let some kind neighbor, more curious than avaricious, experiment for you with the new varieties, which, with a few notable exceptions, like Elberta, are, in my opinion, worthless. Perhaps it would be better to say what I would not plant in my locality and these are as follows: Triumph, Hale Early, Troth Early, Delaware, Yellow St. John, Lewis, Chinese Cling, Bokara, Kalamazoo, Morris White, Old Mixon Cling, Snow Orange, Smock Cling, Moore Favorite, Globe, Stephens Rareripe, Shipley Late Red, McCollister, Lemon Cling, Engle Mammoth, Bequette Cling, Crosby, Pearce Yellow, Silver Medal, Wager, Willet, Steadley, and Bilyeu.

ELEMENTS OF SUCCESS.

I believe, with Roland Morrill, that successful peach growing is indeed a profession and that the production of large quantities of luscious, beautiful fruit and getting it to market in its highest state of perfection is no mean art. He whose selection is made with due regard to soil, elevation, air drainage, and shipping facilities; he, who possesses the willingness and the patience to learn and above all he, who feels a high sense of honor in marketing and an inborn love for his work, may rejoice as did Downing in the realization of the words: "Fine fruit is the flower of commodities. It is the most perfect union of the useful and the beautiful that the earth knows. Trees full of soft foliage; blossoms fresh with spring beauty; and, finally, fruit, rich, bloomdusted, melting and luscious—such are the treasures of the orchard and garden, temptingly offered to every land-holder in this bright and sunny climate."

VEGETABLES.

RICHARD VINCENT, JR., COMMITTEE.

In regards to vegetables, Mr. President, the past season has been one of surprises, the late cold wet spring was, for many varieties of tender plants needing the warm sunshine, much against their growing; and such as did survive the spring blasts had a much harder time in the cold May drought which they had to struggle through.

Altogether it was the hardest season that the majority of our younger growers ever experienced, those who succeeded in raising a crop, some in more favorable situations than others, have been well paid, garden truck, on the average, bringing much more than the average price, and today cabbage is a luxury which only the rich can afford, in fact, all kinds of vegetables are bringing to the fortunate possessor good prices, the highest prices for many years.

ORNAMENTALS.

EDWIN A. SEIDEWITZ, CHAIRMAN.

I know that you are more interested in fruits than in ornamentals, at the same time I believe the time is coming when it will pay you to take an interest in them from a pecuniary point of view. As there are many varieties of fruits, so there are many more varieties of ornamentals, all of which require their special treatment. If the farmers and fruit and vegetable growers would take up some of the more popular varieties and grow them as a specialty it would pay them. The suburban development has made a great demand for ornamentals. Owing to the vast number of varieties the nurseries cannot handle them as a specialty, hence the advantage of those who can take one or more varieties and handle them as they should be. I have written but a few words in reference to this subject.

The past year, I believe, was a banner year in the sales of shrubs and all classes of ornamental outdoor plants. The fact that so many homes are being built in the suburbs of the larger cities has made a great demand for this class of stock. In this line we should class all perennials, for which there is an unusual demand, such that our nurseries in this State have been unable to supply it. The demand for hedge plants has been very good during the season. The California privet being the most popular of this class of plants. The farmers and fruit growers do not, as a rule, interest themselves sufficiently in the adornment of their homes, which is a fault.

As to novelties, there has been nothing much that is new except in the way of roses and perennials. It would hardly be fair to judge their merit after only a few years experience with them. One class of plants that is comparatively new in this section is some of the newer varieties of lilacs, the size of the flower as well as the richer and more delicate colors are novelties in the true sense of the word. A collection of these lilacs should be in the home of all lovers of flowers.

In the way of perennials, the following varieties of recent introduction have been tried to receive their due merit: Stokesia cyanea, cornflower aster, the giant Shasta daisy, Rudbeckia purpurea and the newer hardy phlox.

I believe that our soil and climate are well adapted for the growing of conifers, rare ornamental trees, flowering shrubs, perennials and other plants of these types. If the nurseries would show a little more care in the pruning of the stock there would be better opportunity to find sale for the same outside of the State.

In consideration of the fact that the nursery business must handle such a large number of varieties, it would no doubt be profitable for some of the fruit growers and farmers to take up a particular class of ornamental plants and handle them as a specialty. If one considers the ease with which these plants can be transported in the season when the same are dormant, the farmer with the cheaper land tax could handle many of the different varieties with an advantage.

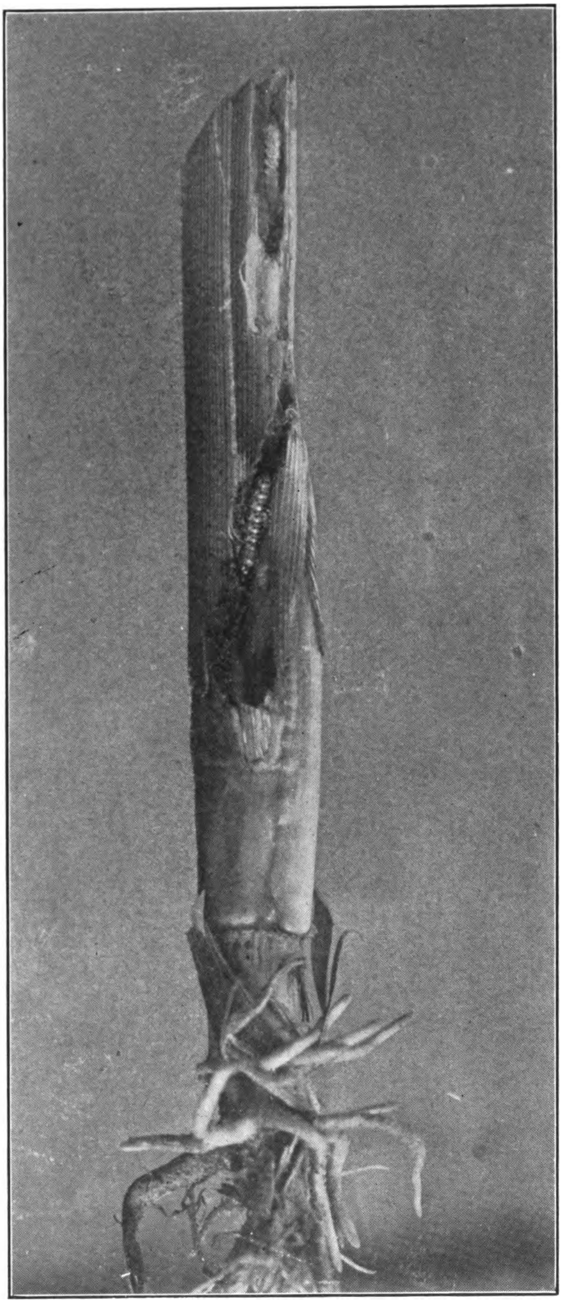
Pæonias now are being pushed forward, thousands of dollars are going abroad to buy them. Lilies of the valley are imported by the million of pips. I simply note these two plants to verify my assertions. It is a simple question, knowledge and energy expended with such a diversity, the farm would be made more attractive, and last but not least more profitable.

FLOWERS.

CHAS. E. SEYBOLD, CHAIRMAN.

Which flowering and foliage plants are best suited to ordinary house culture, and how they should be treated in the living room?

In connection with this question, I wish to briefly state that there are a large number, but the improved strains of geraniums, pelargoniums, flowering begonias, Bermunda oxalis, petunia, nasturtium,



Larvæ of the Corn Stalk Borer (Diatræa saccharalis) in Stalk of Corn.
(Photo by R. I. Smith).

epiphyllum or crab cactus and many others will bloom with ordinary care and sunlight in a living room temperature.

For foliage plants, I would recommend decorative palms, ficus, aspidistras, dracaenas, begonia rubra and metallica, cypress, ivy and others. All these should be sponged occasionally, and a good fibrous light soil mixed with old and well rotted compost manure should compose the potting material. The soil should not be allowed to cake on top. After a while, when the plants have made a strong growth, it may be necessary to top dress the pots with a little wood ashes and bone meal, which is very acceptable to both flowering and foliage plants; the most prominent ingredient in bone meal is phosphoric acid, a plant food of the highest order. The plants should be syringed with clear tepid water on a sunny day. Great care should be taken not to over water house plants. The present time, the middle of January, will show a noticeable change in the growth of window plants, and they should be aided at least twice a month with fertilizers.

Liquid manure is convenient and is very good, but the plant foods sold under different names in packages are quite as good, and the advantages are, that their exact strength is shown in the directions on the package. This food can be applied and stirred into the top soil of pots, where it will slowly dissolve by the moisture of the earth. One special merit of the chemical fertilizers is, that they contain no insect germs, as most barnyard or compost heap manures do. Another is, that they are entirely odorless.

ENTOMOLOGY.

Miscellaneous Entomological Notes for 1903.

PROF. T. B. SYMONS, COMMITTEE.

It would not be feasible for me to discuss all the insects that have come to my notice the past year but only those that have been especially injurious to agricultural and horticultural plants and products. The past season has not been marked by any unusual outbreaks of injurious insects except in one or two cases which occurred locally on the Eastern Shore. It is the purpose of this paper to call attention rather briefly to the more important species and to suggest the most modern means of controlling their ravages.

The Apple-Tree Tent-Caterpillar, *Clisiocampa americana.*— This insect was more or less abundant in the orchards all over the State, though there is really very little excuse for its presence. Our orchardists should learn to familiarize themselves with the egg masses of the insect, for one of the easiest and most effectual methods of controlling the pest is to collect and destroy these egg masses at any time between August and the following spring. The egg masses hatch in early spring and the caterpillars form conspicuous tents. When they first make their appearance, they should be destroyed, or the foliage around them upon which the caterpillar feeds, sprayed with an arsenite. It is advisable to begin spraying when the caterpillars are very small as it will require but little poison to kill them. The accompanying illustration (Fig. 1) shows two caterpillars, the egg masses and a cocoon in which the caterpillar changes to emerge as a moth. Fig. 2 represents the adult moth.

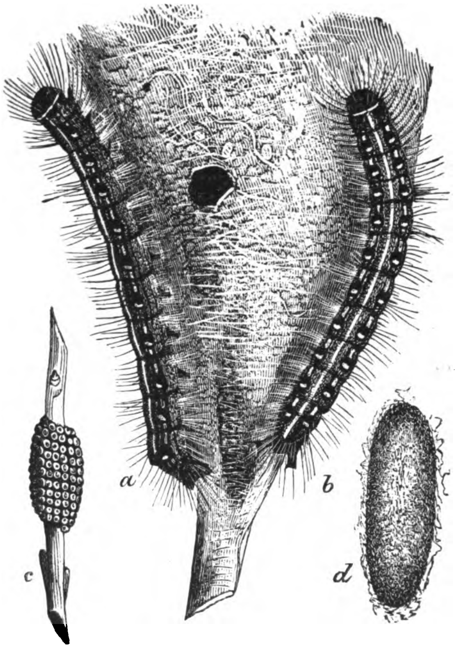


Figure 1. Larvae of the apple-tree tent-caterpillar (Clisiocampa Americana). a and b larvae; c, eggs; d, cocoon. (After Riley).

The Apple Aphis, *Aphis sp.*—The appearance of this aphis in great numbers in early spring was notable, but the unfavorable weather conditions together with the application of 15 per cent kerosene emulsion and "rose leaf," one part to 40 parts of water, held them in check where they threatened to do damage. It would be wise for every orchardist to inspect his trees closely for the eggs of these insects, which are laid generally on the terminal buds of the tree. When they are found they should be destroyed.

The Codling Moth, *Carpocapsa pomonella.*—Owing to the large crop of apples the past season much damage was done by this insect. Time and again the growers have been warned against this pest. The damage done by the insects is not realized by the orchardists until the apples are gathered in the summer and fall. If the trees had been sprayed in the spring and early summer with an arsenite much of the injury would have been prevented.

The Plum Curculio, *Conotrachelus nenuphar.*—There seems to be no let up with this insect, year after year it does its share of the damage to numerous fruits. Many letters were received last spring requesting information in regard to controlling the pest. The best means yet discovered is jarring the trees, every morning if necessary, having a large sheet under them so as to catch the beetles. Many large orchardists find this to be the most economical method of protecting the fruit.

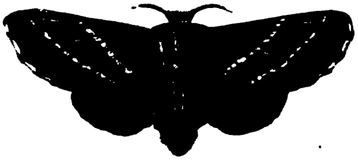


Fig. 2. Adult of apple-tree tent-caterpillar. (After Riley).

The Black Peach Aphis, *Aphis persicæ niger.*—This insect was reported as doing a great deal of damage in many parts of the State. In one instance in Western Maryland the insect killed a number of young peach trees which were planted the preceding fall. It is well known that this pest does its injury by sucking the juices of the plants both from the roots and foliage. In this particular case the principal injury was at the roots. Several remedies have been suggested for this pest, among them applying kainit on the surface of the ground in the vicinity of the trees whose roots are infested, has been employed with good results. But this is a rather dangerous procedure as the weather after application may be exceedingly wet and the salt will then be sent down to the roots all at once, so to speak, and in that case, if a limited amount had not been applied, may prove injurious to the trees. Last spring a case of this character was observed with the result that some trees died. The safest and most efficient remedy in practice is to use tobacco dust; digging away some of the earth from around the infested tree in order to place the dust in close proximity to the roots. This proved to be effective in killing the aphis. Not only is tobacco dust a good insecticide in this case, but it is a good fertilizer. It kills the aphis and will furnish nourishment to the tree. Where this pest occurs on the foliage, spraying the infested parts with a strong tobacco decoction or with whale oil soap at the rate of one pound to three gallons of water, will be effective.

Melon Aphis, *Aphis gossipii.*—This insect is not mentioned from the fact of the seriousness of its injury the past season, but that it was conspicuously absent and also to show the periodicity of some insect pests. In past years it has been a source of much apprehension on the part of the melon growers in some parts of the State. While it has appeared in injurious numbers in one or two cases, it was successfully controlled by fumigating with carbon bisulphide and the application of 15 per cent kerosene. The fumigation method seems to be practicable, especially on small areas where the pest is discovered at its first appearance.

The Pear Leaf Blister, *Phytoptus pyri.*—In traveling over the State the past season injury to the pear foliage from this pest was conspicuous in the majority of orchards. In some cases it was quite serious, all the foliage being affected. The mite does its injury by forming little galls on the leaves. The galls or blisters are swellings on the leaf, within which is a cavity affording a residence for the mites. On the lower side is an opening through which the mite that started the gall entered, and from which the young mites developed in the gall can escape in order to start new galls. The creature causing this injury is exceedingly small, being practically invisible to the unaided eye. The body is cylindrical in form, tapering slightly towards each end. The entire length of the mite is about one one-hundred-and-fiftieth of an inch; and the width about one-fourth as great. The life history of the species has been thoroughly worked over by Messrs. Comstock & Slingerland (Bulletin 23, Cornell University). Briefly it may be stated as follows: The female mites lay their eggs in the gall that they have formed. In a short time the eggs hatch and the tiny mite crawls out of the gall through the opening on the under side of the leaf and seeks a healthy part of the leaf and commences to form other galls by boring into the tissue. The mites migrate as soon as the leaves become dry to the leaf buds at the ends of the twigs, where they remain throughout the winter under the leafy scales. It is seen from the above that the mites live within the tissues of the leaf and therefore are beyond the reach of the ordinary insecticides. It is only left for us to catch it before it commences the gall. As it migrates to the leaf bud in autumn and remains there during the winter, this seems to be the only time in its life history when we can destroy it. This is accomplished by trimming and burning the young wood together with burning the fallen leaves and other rubbish in the orchard, as some of the mites may have fallen with them.

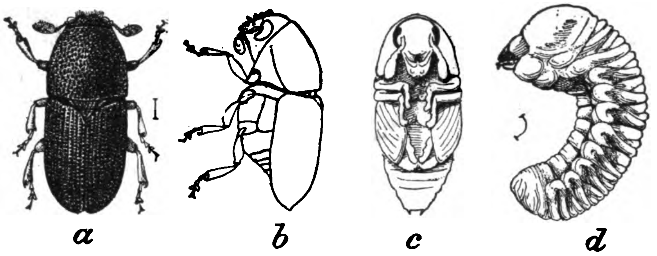


Fig. 3. The fruit-tree bark-beetle (Scolytus rugulosus). a, adult beetle; c, pupa; d. larva. All magnified. (From Chittenden Cir. 29. S. S. Div. Ent. U. S. Dep't Agri.).

The Fruit-tree Bark-Beetle, *Scolytus rugulosus.*—Although this insect was described in the fourth annual report of this Society it appears to be of sufficient importance to call your attention to the pest again. Numerous letters have been received the past season, containing specimens of the insect and asking for information in regard to the same. It is a small black beetle doing its damage by boring into the trunk and branches of the tree. A common name for it is the shot-hole borer from the fact that it makes holes in the bark about the size of small shot. After it bores through the bark it makes channels up and down in the wood. In little pockets formed on the side of these channels the female lays her eggs. According to Professor Chittenden of the United States Department of Agriculture,

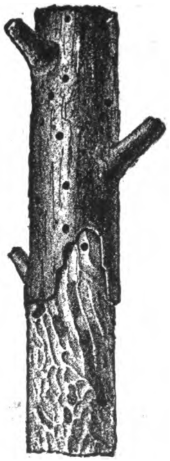


Fig. 4. Showing work of fruit-tree bark-beetle on twig of apple. (From Chittenden, Cir. 29. S. S. Div. Ent. U. S. Dep't Agri.).

its life cycle extends over a period of from four to six weeks, and there are probably four generations in this latitude. In the past this insect has been known to attack generally sickly or half dead trees, but it seems from observations the past season that it is more and more adopting the habit of attacking perfectly healthy ones. While it generally starts its work in brush wood or dead branches it will leave them and injure the surrounding healthy ones. The ravages by the insect on plum, peach and cherry has been very pronounced in many orchards. From the fact that this insect bores into the trunk and branches it is a difficult one to deal with, and where a tree becomes infested, it should be at once dug up and burned, to protect as much as possible the surrounding trees. It is of prime importance that the orchardists should keep all dead wood cut out of the trees and also to keep all of the brush burned, as a neglect of these points will oftentimes bring about severe damage. The trees should at all times be kept in as healthy condition as possible as this sometimes prevents insect attacks. Figs. 3, 4 and 5 represent the beetle and its work.

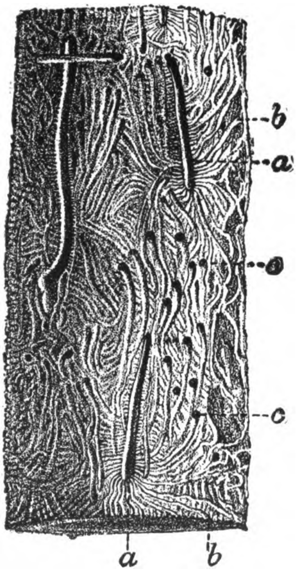


Fig. 5. Showing galleries of fruit-tree bark-beetle under bark of a twig; aa. main galleries; bb, side galleries; cc, pupal cells. Natural size. (From Chittenden, Cir, 29, S. S. Div. Ent. U. S. Dep't Agri.).

The Asparagus Beetle, *Crioceris asparagi* and the Twelve-spotted Asparagus Beetle, *Crioceris* 12-*punctatus*.—These two insects occurred in injurious numbers on asparagus beds throughout the State. The beetles pass the winter in the adult state under convenient shelter, and in April or early in May, according to the locality, the former issues from its hibernating quarters and lays its eggs for the first brood. These eggs hatch in from three to eight days, and the young larvæ at once begin to feed on the plant. In this species the larvæ do the greatest damage, but with the latter species the adult hibernating beetles do the greatest damage in early spring upon the young and edible asparagus shoots. Later the beetles as well as the larvæ appear to feed upon the berries. Both of these pests are rather difficult to control, but they can ordinarily be held in check by employing simple means. The practice of many growers is to cut down all plants including volunteer growth in early spring to force the beetles to deposit their eggs upon the new shoots, which are then cut every few days before the eggs have time to hatch. Applying air-slacked lime dusted on the plants in early morning while the dew is on them sometimes destroys a large majority of the larvæ with which it comes in contact. Applying arsenites mixed with flour or other powder will serve to control the pest. This will also affect the beetles as well as the larvæ. These remedies will be equally effective against both species.

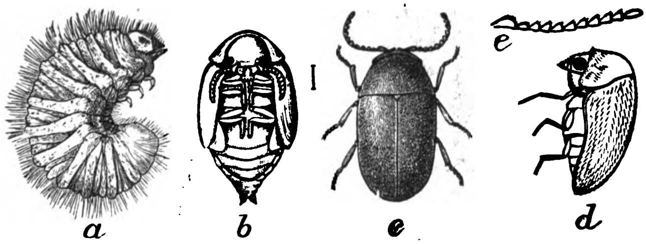


Fig. 6. The cigarette beetle; a, larva; b, pupa; c, adult; d, side view of an adult; e, antenna; all parts greatly enlarged. (After Chittenden, Div. Ent. U. S. Dep't of Agriculture).

The Cigarette Beetle, *Lasodermer serricorne.*—While this insect does not trouble the horticulturist, in reporting the insects which have been important as doing damage the past year, a mention of this pest will not be out of the way. While this insect is called the cigarette beetle, its ravages by no means are restricted to cigarettes. It makes no distinction of any kind of cured tobacco, but it may be said that its work is more serious in the finished product, cigars or cigarettes. However, we have more complaints of trouble in controlling it in the cured leaf tobacco. It does its damage by eating small holes in the leaf and riddling the stem and when occurring in cigars or cigarettes the small holes which they eat through, then make them worthless from the consumer's standpoint. When the pest occurs in tobacco warehouses or factories, it is very difficult to eradicate. Frequently large stocks of tobacco are kept on hand and all of the cracks and crevices in the building are usually filled with tobacco dust. This enables the insect to get a good foot-hold and in order to eradicate it, the building and the tobacco in store must be fumigated with either hydrocyanic acid gas or carbon bisulphid, and then given a thorough cleaning. The direct injury does not generally fall on the tobacco leaf merchants, and they are usually negligent in controlling the pest as they sell the tobacco to the manufacturer who suffers from its work. It is discovered when the tobacco comes into the latter hands and in being worked up the injury of the pest is most apparent. Not only does the manufacturer discover that a large part of the leaf tobacco is riddled, but that he has introduced the pest into his factory. It is therefore of prime importance that the tobacco leaf merchant as well as the manufacturer, watch his stock of tobacco very closely so as to kill out the insect when it appears. Figs. 6 and 7 show the insect and its work.

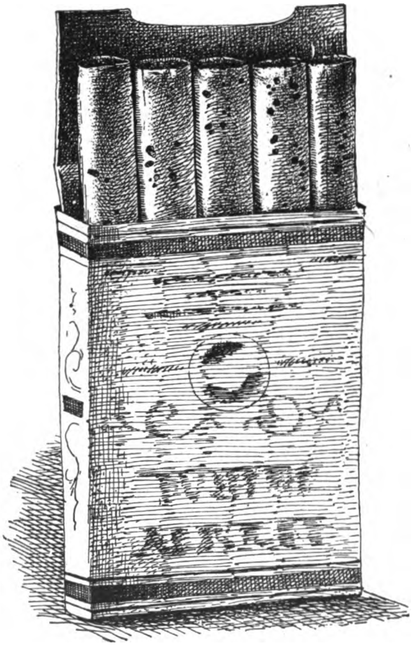


Fig. 7. Work of cigarette beetle in cigarettes. (After Howard, Div. Ent. U. S. Dep't Agriculture).

The Corn-stalk Borer, *Diatraea saccharalis* (see plate IV) and the Stalk Borer, *Papaipema nitela,* caused serious injury in the corn fields on the Eastern Shore. Further notes an these and other injurious insects will be given in my report to the Peninsula Horticultural Society. There are a great many other insects that have appeared in injurious numbers over the State the past year but space forbids their consideration.

BOTANY.

Botany in the Public Schools and on the Farm.

PROF. J. B. S. NORTON, COMMITTEE.

There are many persons, young and old, who have a desire for increased knowledge, and have a natural taste for work in natural science but who cannot leave their work for a course at College. To such persons there may be no more delightful or instructive pursuit than study and observation at odd moments of the mineral, plant and animal objects found on the farm, or even on city lots, and their relations to one another. And there is no better way to develop the child's mind in a sane and healthful way than by such exercises reasonably directed. Many persons, while hindered by sickness, or otherwise, from doing harder work could make life enjoyable and useful by such pursuits indoors or outdoors. This committee can probably do no better work than to encourage such studies of the vegetable life of the farms, gardens and yards of the State. Moreover such work by individuals without technical training, may bring new ideas to the professional scientist, who, too often, gets into scholastic ruts.

Public school teachers could direct their pupils in such work, and some time is now being devoted to elementary natural science in many schools. If the pupil's attention could be attracted to roadside plants in coming and going from school, as well as in the meager time that can be devoted to that work in school hours, much will be gained. In such work the first thing to be borne in mind, by teachers as well as pupils, is that plants are living things which feed, respire, move, and in the most fundamental life relations, differ but little from animals. This attitude of mind makes them seem much more worthy of attention, although the supporting evidence of such a view is not so readily apparent as with animals without some investigation. And here I would say that the *little* things should not be neglected. The mosses, lichens, mushrooms, even the green water scum, are as interesting, not to say beautiful, as larger plants like oaks and apple trees; the weeds on city lots and in back yards, offer material for almost every line of botanical work the city teacher needs to take up, and the life processes going on and the variety of plant structures to be found under the snow or underground in winter, are only somewhat less varied, but more interesting because less known, than the above ground vegetation.

Several lines of observation of plants could be taken up. One of the first thought of would probably be a consideration of the *different kinds* of plants to be found on a farm, a city lot or close to a certain strip of road or if taken up by several persons, the flora, of a whole town, district or community. The names can be learned from the teacher, or other persons who may have some knowledge of them, or possibly from a manual. A more correct method would be to send specimens, of flowers, seed vessels and leaves of the unknown kinds to a professional botanist.

In connection with this work, a herbarium or collection of dried specimens could be made in which the plants observed could be preserved for comparison with others and arranged according to their resemblances. The young student would soon learn to pick out representatives of many of the natural families of plants like grasses, legumes, composites, etc. It is a very simple matter to make such a collection by pressing the specimens, which should consist of whole plants, if small enough, or at least contain all the characteristic parts, between several thicknesses of newspaper, which should be placed in a pile under a heavy weight, and changed daily until the plants are dry. With each specimen should be kept notes of all that is known about the plant, where it came from, when collected, the color of the flowers, its abundance or rarity, what kinds of plants grow with it, whether stock eat it or it is useful in any way, or a weed or poisonous; the kind of soil grown in, the insects found on it, or anything interesting in its structure or method of life.

This collection of plants or notes would furnish a basis for all other botanical observations and studies, and it is hard to do connected work of other kinds with plants, without some knowledge of the species and without some kind of names by which to designate them. Then, too, the acquiring of the names of the plants (common as well as Latin) finds a more proper place in the elementary schools than in the higher institutions, where botany is naturally concerned chiefly with the more important problems of morphology and physiology.

These two branches just mentioned should, by no means, be neglected in the work of which this report treats, since they are vitally connected with the practical operations of farm and garden. Many of the common life functions of our cultivated plants, and the structures and arrangements of roots, stems, wood, bark, leaves, flowers, etc., for the performance of these functions can be delightfully unfolded to young minds by many simple observations or experiments; the planning of which to avoid possible sources of error in conclusions will give excellent mental training. Some of the advanced problems relating to the manner in which crops live and supply the products desired by man, are, of course, more complicated and their solution vastly more important than those of the higher mathematics taught for mental training in colleges and universities, but many are simple enough to interest the youngest. A few examples may be mentioned to begin with:

Can plants move? Watch a sunflower bud at intervals from morning to night. Observe the manner in which clover leaves close at night. Such observations will also indicate that plants are sensitive to light and other forces and conditions.

How do the leaves act? Test by removing one-half of the leaves from some potato plants, all from others, none from some. What difference in the potatoes produced? How can it be shown that this is not due to wounding or other cause rather than loss of leaves?

Does cold weather or moisture injure seed corn? Try by keeping some over winter in wet, cold, dry and warm places.

Cut a ring of bark off growing branches of different kinds of trees, each month, and note the effect next year, as compared with uninjured ones on the same tree.

Germinate some garden seeds of different kinds, between moist cloths or paper and watch the process of development and the new organs formed as well as the changes of those already in the seed.

An interesting and very valuable line of observation would be the study of the kinds of plants found on various parts of the farm, and the differences in soil composition, state of cultivation, water content, etc., which are found with the various associations of plants? The development of forests from cultivated land could be followed up for several years, noticing first the appearance of annual weeds, then perennial weeds and grasses followed by shrubs, next pines and cedars and these possibly followed by other trees springing up under the evergreens. Another good ecological problem would be an examination of different orchard varieties with reference to their power to set fruit without the help of insects. Considerable could be learned by tying bags of fine netting over the buds before they open, to prevent the access of insects, leaving them on until the flowers are gone.

A collection of notes on the local uses of wild plants would be highly desirable. The following list shows a few uses of some Maryland plants. Almost anyone could add items to it.

Berries used as fruits: Wintergreen, 12 kinds of huckleberries, ground cherries, partridge berries, 2 kinds of elderberries, black haw, cranberry, hackberry, red and white mulberry, 2 kinds of gooseberries, 2 of currants, 3 of raspberries, 8 of blackberries, 5 of dewberries and 2 of strawberries.

Other fruits: Persimmon, pappaw, mayapple, wild crabapple, service berries, prickly pear, several red haws, 3 kinds of plums, 4 of wild cherries and 7 of grapes.

Nuts: Beech, hickory, chestnut, chinquapin, 12 kinds of acorns, walnut, butternut, water lily seeds, hazel and nut grass.

Fiber may be obtained from: Milk weed, wild flax, velvet plant, basswood, hemp; willows, leatherwood, hickory splits and various grasses and rushes used for wicker work might be classed here.

Useful as greens, salads, etc.: Pepper grass, shepherd's purse, mustard, water cress, field cress, dandelions.

Other edible products: Maple syrup, maple sugar, oxalis for pies, many kinds of mushrooms, wild rice, chicory, artichoke, groundnut.

Dyes have been obtained from: Walnut, sumach, indigo, madder, oak, puccoon, alder and others.

Christmas greens are furnished by our pines, cedars, etc., for trees, and holly, mistletoe, ground pine, and others for minor uses.

Other decorative materials are birch bark, bitter sweet canes, buckeyes, grasses, smilax, seaweeds.

Miscellaneous products: Tar, wood pulp, pine leaf fibre, excelsior, the various resins, gums, etc.; whistles from chestnut, willow, hickory, etc.; elder pop-guns, teasel, puff ball sponges, tanbark, hops, sphagnum moss and eel-grass for packing, punk, cattail fur, and wax from wax myrtle berries.

The following *official medicinal plants* grow wild in this State, besides many popular remedies: Grindelia, fennel, lady slipper, slippery elm, wahoo, thoroughwort, geranium, black mustard, white mustard, wintergreen, witch hazel, Canadian hemp, pleurisy root, black haw, calamus, caulophyllum, worm-seed, pipsissiwa, black snake root, blood root, prickly ash, elder, dock, dewberry, blackberry, poison ivy, sumach, hydrastis, blue flag, burdock, raspberry, podophylum, poke, pennyroyal, erigeron, sweet birch, Culver's root, lobelia, hops, horehound, yellow parilla, peppermint, spearmint, sassafras, scutellaria, senega, dutchman's pipe, pink root, jimson weed, tansy, dandelion, horse mint, bearberry, hellebore, white oak and wild cherry.

Books are not necessary, but one or more of the following would be helpful.

Coulter, "Plant Relations," D. Appleton & Co., New York.

Bergen, "Foundations of Botany," Ginn & Co., Boston.

Leavitt, "Outlines of Botany," American Book Co., New York.

Bailey, "Talks Afield," Houghton, Mifflin Co., Boston.

McDougal, "Elementary Plant Physiology," Longmans, Green Co., New York.

Andrews, "Botany all the Year Around," American Book Co., New York.

Masters, "Plant Life on the Farm," Orange Judd Co., New York.

Bailey, "First Lessons With Plants," Macmillan Co., New York (for young children).

The writer will be glad to give further assistance to anyone who wishes to take up studies suggested by the above outline.

PLANT PATHOLOGY.

PROF. J. B. S. NORTON, COMMITTEE.

The following report gives a brief summary of the most notable plant diseases occurring in Maryland during 1903. They are classified according to the crop attacked, and preceded by a discussion of the general pathological conditions of crops for the year. The names of parasites causing diseases are given in parenthesis. Some of the distinguishing marks of the diseases are given to aid in their recognition by those unfamiliar with them. Some notes on treatment are also given, when the information would be of special value. Many valuable additions to this report came from correspondents all over the State.

General Conditions.

The abnormally wet, cold season had a marked influence on the health of many crops, causing a heavy reduction, especially in central Maryland in the yield of corn, and other crops which require dry and warm soil, but many fungous diseases abundant in dry weather did little damage. Serious damage was done to many crops by weeds which could not be removed on account of wet fields. The rains also, by destroying pollen, prevented the setting of fruit on pears, tomatoes, and in some cases prevented corn pollenation. The cold weather in February following a very warm January injured the wood of many fruit trees, such trees may be recognized by the loosening of the bark near the base, and the wood internally being dead and dark colored, or if not externally noticeable, by the unhealthy color of the foliage. Severe frosts at blossoming time destroyed most of the fruit, especially of strawberry, pear and peach. Heavy winds in October caused the loss of much fruit on the Eastern Shore. All together the weather conditions, according to one report from the northern Eastern Shore, were the most unfortunate for fruit in 35 years.

Injury by wet soil to the roots of clover, wheat and fruit trees was common and followed by attacks of fungi, causing root rot.

Crown gall has been found generally on apple and also frequently on peach, to which it is very destructive, as also to plum and raspberry. Mr. C. E. Koogle, of Washington County, reports more loss from it in that county in orchards than from peach yellows.

The nursery stock in the various nurseries in the State was found to be as clean from disease, and as well cared for as could be expected and in a better condition than in many other States.

I.—Diseases of Pome Fruits.

Fire Blight (*Bacillus amylovorus*) on apple, pear and quince, recognized by dead and blackened twigs and branches on which the dark-colored leaves hang, was very uncommon this year, probably largely due to the killing by frost of the pear flowers, in which the disease starts.

APPLE DISEASES.

Hairy Root. Cause not known, perhaps same as crown gall, recognized by many small, stiff, wiry, fibrous roots developing from the tap root, which usually dies or is severely injured; should not be planted; common in nurseries.

Root Rot. Noticed in nurseries where soil was wet; reported bad in older trees in Dorchester County, but usually where poorly cared for.

Canker. A name applied to dead sunken areas in the bark or wood, especially when surrounded by a raised ring of new growth; caused by several fungi, especially those associated with bitter and black rot of the fruit; more common in old trees. The diseased part should be cut out, down to fresh wood and bark and painted over with a protective material containing a small amount of some fungicide, and the tree sprayed thoroughly with Bordeaux mixture.

Rust (*Gymnosporangium sp.*) Causing thickened yellowish spots on leaves and sometimes on fruit; produced by the cedar apple fungus; treatment: Bordeaux mixture, resistant varieties and removal of cedar trees near orchard; noticed abundant this year in Talbot and Queen Anne County orchards near cedar trees.

Fire Blight. Uncommon, more reported on Alexander variety in Garrett County.

Scab (*Venturia inaequalis*). A fungous injury to fruit causing dark, external spots and cracks and often, this year, seriously injuring leaves in spring. Treatment: early spraying with Bordeaux mixture is very effective. Abundant in most of the State, but in some sections of northern Maryland fruit was quite clean, except on susceptible varieties. Reported very bad in Frederick County.

Bitter Rot (*Gnomoniopsis fructigena*) and Black Rot (*Sphaeropsis malorum*), the former recognized by deep, rotten, bitter areas in fruit with spore dots in rings in the surface; the latter with darker more superficial rotted areas covered irregularly with black dots. The black rot very bad in most eastern parts of the State; controlled by spraying with Bordeaux mixture and removal of rotten fruits and cankers on branches. Bitter rot troublesome especially in western and southern Maryland, takes more persistent and thorough spraying and it is especially important to remove the diseased fruits from the ground under the trees. Worse in some varieties.

Baldwin core rot was troublesome in Frederick County.

PEAR DISEASES.

Cold injury and body blight (*Sphaeropsis malorum*). Winter cracks and loosening of the bark followed by the body blight fungus, caused severe injury especially to Kieffers (see apple canker).

Fire Blight. (See above).

Leaf Blight (*Entomosporium maculatum*). The fungus makes small spots on the leaves and fruit, the leaves fall early, which may also induce fall flowering, both of which lower the vitality of the tree, and the fruit is less salable. Treatment: two or three sprayings with Bordeaux mixture. Unusually abundant and destructive in Chesapeake Bay counties, causing the loss of almost all pear foliage before August 15th; the loss to fruit was heavy.

QUINCE DISEASES.

The quince is attacked by nearly the same diseases as apple and pear. In Maryland the quince trees planted are usually neglected and, consequently, much damaged by diseases. If the diseased branches and rotten fruits are trimmed out and the tree sprayed with Bordeaux mixture, after flowering, the benefit will often be surprising.

II.—Diseases of Stone Fruits.

PEACH.

Yellows. Cause unknown; recognized by premature red-spotted fruit or slender shoots with narrow yellow leaves. Dig up and burn at once to prevent infecting others, and plant from nurseries where there is no danger of infected stock. Yellows bad this year in northern Washington and Frederick Counties and from northern Montgomery to Cecil, when not cared for. Almost no yellows seen in Kent, Queen Anne and Caroline Counties, and less in the Blue Ridge peach ridge than last year. Our records show that the yellows has decreased rapidly in Maryland since the inspections for this disease were started. Good growers now have no fear of this disease.

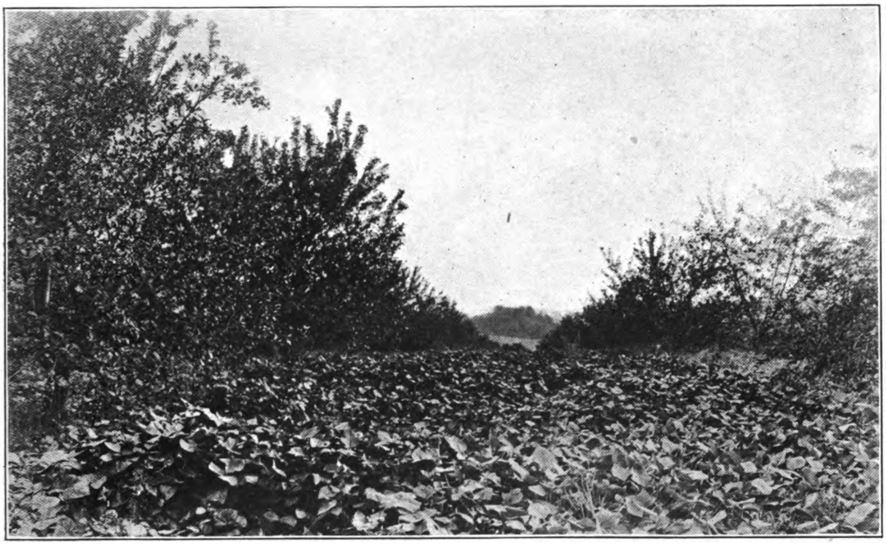
Winter Injury (See above). Several cases investigated in Frederick, Anne Arundel, Prince George's and Dorchester Counties; several fungi associated with loosening of bark and killing of wood near base of tree.

Gummosis. The exudation of gum from trunk and branches is noticed frequently and is due to various things causing bark injury. In some cases parasitic fungi or bacteria seemed to be associated with the disease.

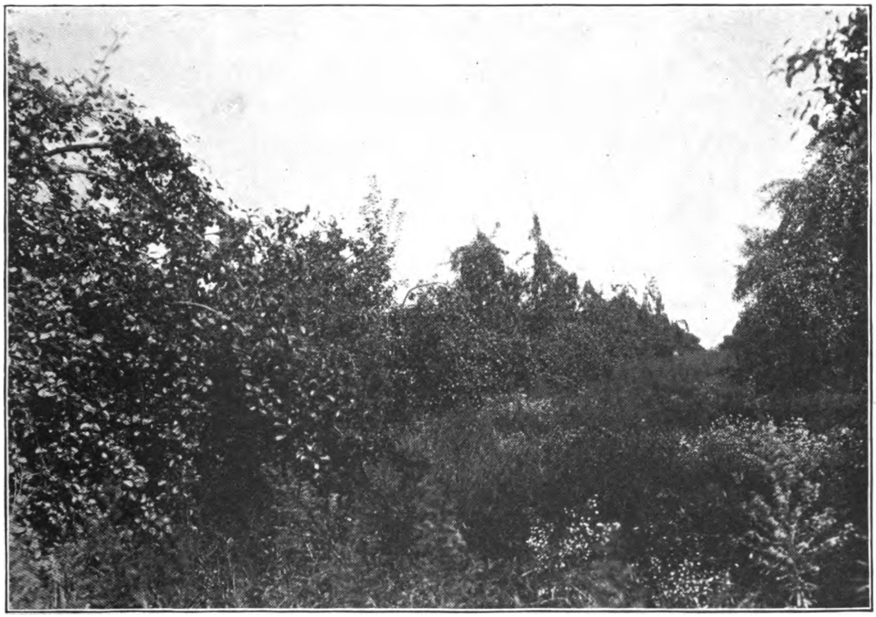
Leaf Curl (*Exoascus deformans*), causing the leaves to be distorted and to fall in early summer was common, as usual. The lime and sulphur treatment reduces it materially. Bordeaux mixture, before blossoming, should be applied to the susceptible varieties, when the scale treatment is not needed.

A white mildew was abundant on leaves and twigs of the Tillitson variety, but did not affect others.

Brown Rot (*Sclerotinia fructigena*) causes the fruit to rot, especially when ripe or injured, and may cause a blossom and twig blight; distinguished by these effects and by the dried mummies of the rotten fruits, which, after lying on the ground over a year, send out small mushroom growths from which spores infect the blossoms. Treatment: Destroy the rotten fruit. Spraying with diluted Bordeaux mixture has been successfully used. Spraying the ground where rotten peaches may be lying at blooming time has recently been advised. Mr. W. C. Travers reports almost no rot where sheep and hogs have free access to orchards, while others near by rotted. Brown rot was very abundant in Maryland orchards where any peaches were present this year, especially on early fruit. The Sclerotinia stage appeared abundantly at blooming time, in some places covering the ground under plum trees, but rain destroyed it in a few days.



Cow Peas in Young Apple Orchard.—S. S. Stauffer, Sharpsburg.
(Photographed by Prof. C. F. Austin).



Young York Imperial Apples, 1903.—S. S. Stauffer, Sharpsburg.
(Photographed by Prof. C. F. Austin).

PLUM DISEASES.

Plum Pockets (*Taphrina deformans*), causing swellings and distortion of young twigs and fruit. Spray early with Bordeaux mixture. Abundant on many plums in central and eastern Maryland. Some wild plums almost covered with it.

Black Knot (*Plowrightia morbosa*), causing rough, black swellings on twigs; cut out, and spray with Bordeaux mixture. Bad as usual in southern Maryland.

Brown Rot (See under peach). Very destructive this year on plum; usually follows curculio injuries. Difficult to control on many varieties.

CHERRY DISEASES.

Sweet cherries are generally reported to be grown with difficulty and often when planted soon die. The wild form of this species is at its best in this State.

III.—Diseases of Grape.

Black Rot (*Guignardia Bidwellii*) was quite serious in Prince George's County. Easily controlled by several sprayings of Bordeaux mixture; as is Mildew (*Plasmopara viticola*), which was not so common as last year. Anthracrose was not common. Grapes in general made a full crop with little fungous injury.

IV.—Diseases of Berries.

Cases of raspberries seriously injured by crown gall were noticed; strawberries were not seriously injured by leaf spot (*Sphaerella fragariæ*), which was present as usual. The crop was injured by late frosts and rains, and fall fruiting was common.

V.—Diseases of Chestnut.

Many chestnut trees in Kent County were reported killed by crown gall.

VI.—Diseases of Flowers.

Several cases of injury to florists stock by coal gas from stoves were noticed. Calla bulb rot caused considerable loss in Frederick and Baltimore Counties. A carnation disease, causing the petals to adhere in the bud so that the flowers could not open, was investigated in Anne Arundel County.

Mildew was frequent and injurious on roses and was especially troublesome outdoors to the leaves and buds of Crimson Rambler. Dusting with sulphur is a good treatment.

VII.—Diseases of Vegetables.

ASPARAGUS.

Rust (*Puccinia asparagi*) did much less injury than last year. Good care, fertilization and cultivation reduced the loss much. Thorough and persistent spraying with Bordeaux mixture was successful in controlling the rust.

A blight of beans is reported from Washington County.

CABBAGE.

Mildew (*Peronospora parasitica*) was not so bad on young plants as formerly. Tests of several fungicides showed Bordeaux mixture, applied frequently to the young plants, was most effective, together with forcing by nitrate of soda, and withholding water.

Bacterial Soft Rot, Black Rot and Fusarium wilt caused serious injury in fields where they have been introduced, especially in the trucking regions near Baltimore and Washington. New ground and particular care to keep the plant beds free from the parasites are about the best treatments that can be recommended.

Club Root (*Plasmodiophora brassicae*) is causing much damage near Cumberland, and is also reported from several other places. Use new ground or liberal application of lime.

LETTUCE.

A greenhouse rot caused the loss of as much as 75 per cent of the crop in some houses.

MELONS.

Cold wet weather caused almost a total failure of the cantaloupe crop in Washington County, and injured the fruit in the more eastern counties.

Bacterial Wilt (*Bacillus tracheiphilus*) is causing the loss of one to two-thirds of the vines in many parts of Anne Arundel County, and occurs seriously in other places. Judge Tydings reports that cantaloupes planted on ground where an orchard had stood for twenty years were free from the wilt, also on a field where rye was turned under; adjoining fields being badly injured.

Blight (*Macrosporium cucumerinum*) causes circular brown spots on the leaves and did some damage to cantaloupes, but was much less abundant than last year. Three sprayings with Bordeaux mixture controls it.

PEA.

A root rot of peas caused some damage in the truck region south of Baltimore. A fasciation disease from the same section causing enlarged vines and clusters of useless flowers, is being studied by my assistant.

TOMATO.

Fruit Scald by hot sun was bad in July on early tomatoes.

Fruit rot was frequent, as usual, but not serious.

Southern Blight (*Bacillus solanacearum*) causing wilt and blackened fibers in the stems caused losses in many fields south of Talbot County where it was not seen by our inspectors. Long rotations should be practiced where this disease is prevalent.

Leaf Blight, causing spots on the leaves and finally their death, caused much loss in all the tomato-growing region of Maryland, except in the extreme north. Fields sprayed with Bordeaux mixture showed much benefit from the spray. It should be applied frequently to the plants in the bed, and at least once after planting.

There were the usual losses from wet weather preventing the setting of fruit.

WATERMELON.

In a field near Annapolis many vines were noticed where the flowers were replaced by small clusters of leaves.

VIII.—Diseases of Farm Crops.

ALFALFA.

Dodder (*Cuscuta sp.*), a small yellow parasitic vine, is occasionally seen. The plants to which it is attached should be cut and burned before the dodder seeds.

CLOVER.

A species of dodder also occurs frequently on clover.

Broom Rape (*Orobanche minor*), a yellowish-brown, stout, erect plant without leaves with a spike 2 to 10 inches long of flowers one inch long producing very small seeds, and parasitic on roots of clover and related plants, has been found at Snow Hill and Beltsville. It often causes serious injury when abundant. Every effort should be made to prevent its further spread.

CORN.

Smut (*Ustilago zeæ*) usually affects less than one-half per cent of the stalks. As usual, in wet seasons, it was less common this year, but one field in Prince George's County had 10 per cent affected. Another variety near this was much less affected.

OATS.

Rust (*Puccinia coronata*) was very bad wherever oats were grown in the State.

POTATO.

Rots of various kinds augmented by very wet weather in late summer caused the loss of at least ten per cent of the crop. It was reported especially bad in Frederick and Harford Counties.

Scab (*Oospora scabies*). Is generally prevalent. For treatment see Question Box discussions.

Blight caused considerable injury in many parts of the State. Spraying was not always beneficial. Considerable difference was noted in the effect on different varieties.

SWEET POTATO.

Black Root was injurious in Anne Arundel and Caroline Counties. Too much care cannot be observed in keeping it from the plant beds.

WHEAT.

Rust (*Puccinia sp.*) reduced the yield much in many places.

Bunt (*Tilletia tritici*) causing swollen grains with black stinking contents occurs occasionally and was seen in Dorchester County.

Loose Smut (*Ustilago triciti*) causing black heads was common but not serious in many fields.

Notes on Treatment.

W. C. Travers, Taylors Island, says that when the lime, sulphur and salt was used in orchards, they were comparatively free from fungus diseases. May others report similar experience. This, however, does not apply to fungi attacking new growth late in the season.

Geo. W. Hopkins, Princess Anne, writes: "I had a patch of early tomatoes which I sprayed four times, there was scarcely any blight in them. I planted late tomatoes for canning house, sprayed one part of them four times, did not spray the others at all. The ones that I sprayed were the finest tomatoes I ever grew, the others were badly blighted. I saw several patches in this place and all were full of blight, some so bad that the owners did not get more than one-third of a crop, mine were all treated the same except spraying, and there was a marked difference in the ones that I sprayed and those I didn't spray. I also began spraying watermelons as soon as they were up, I always had trouble in getting a stand, but I kept them full of Bordeaux this season and never lost one hill and raised some of the finest melons that I ever raised. I was successful in the use of Bordeaux, I intend to use it liberally next season."

A. B. Twining, Forest Hill, writes: "I think I scored a success in spraying my tomato plant beds with Bordeaux mixture and Paris green added to kill the flea bug. The flea bug ate hundreds of thousands of tomato plants in Harford last spring, and plants were very scarce, while I had a fine lot of them, and raised 1,700 bushels from five and one-half acres, while many of my neighbors on as good land had less than 100 bushels to the acre. The plants seemed to blight in the summer, many of the leaves and blossoms falling off. A neighbor bought plants from me (3000) after I was done setting and had double the crop from them that he did from others by their side, and not sprayed. I think my experience will cause the use of considerable Bordeaux next spring."

H. J. Beard, Feagaville, states "that with a number of York Imperial apples we had sprayed with Bordeaux mixture, there was one tree that stood off from the others and which we didn't spray. That tree did not have one-half bushel to remain to ripen, while those that were sprayed yielded over ten bushels each."

J. P. Blessing, Brownsville, writes "Apple scab and bitter rot prevailed to some extent. Varieties heretofore subject to bitter rot were nearly exempt this year, where sprayed three times with Bordeaux mixture, once before blooming and twice after."

Samuel L. Hargett, Frederick, writes: "Practically no spraying is done in this section for fungus diseases. In regard to apples, the crop was very heavy, but the fruit was, as a whole, nothing but a speckled mass. The R. I. Greenings were especially unsightly, and if they had been placed on the market beside New York fruit, which had been sprayed, they would have been almost saleless. There were plenty of fine apples in regard to size, but they all had the same fault, in looking so unsightly. As a fair illustration, one of the apple buyers of Frederick County got quotations from Pittsburg: 'Prime apples, $4 to $4.50 per barrel; firsts, $3 to $3.50.' The man shipped a carload of his prime, they were in competition with New York sprayed apples, and while there was no doubt to their being equally as large, the Frederick County fruit brought $2.00 a barrel, not even the price of New York firsts."

NOMENCLATURE AND NEW FRUITS.

ORLANDO HARRISON, COMMITTEE.

Nomenclature should be a household name to every fruit grower, and new fruits should demand the attention of the most skeptical grower. We should have means of public education and there is nothing better than the individual planting the tree or plant and experimenting with it himself.

There have been many truthful descriptions of new fruits sent out as to their value, where originated, and these descriptions have caused many to be tested, proving them in some instances a success and in others a failure.

PEACHES.

We should encourage the introduction of new fruits, for instance, take peaches. According to the record, in 1840 Troth's Early first came in prominence and now to take the place of that small peach, we have many valuable varieties of the Chinese strain that are larger, healthier and more vigorous trees, that suit our climate and will make the grower money, where some varieties planted twenty years ago will not pay expenses.

The successful fruit grower is giving the selection of varieties more attention from year to year. Among the new peaches that have attracted attention in the State, that have been fully tested and not yet planted extensively, is the one Mr. Allen asked the fruit growers of the State to sample last summer at his place, "The Ray." The trees are now six years old, and the parent tree is sixteen years old and has never failed to give a crop of fruit. At this field meeting there were many of the representative fruit growers of Delaware and Maryland as well as from other States, and while the cantaloupes disappeared before the guests, the topic of comment was the peach orchard loaded with fine luscious fruit, that was paying the grower such a handsome price.

This orchard has paid the grower one dollar per tree clear of all expenses, except the growing and hauling, which was but a little each year since it was planted. The marked success he had with his small orchard led him to have us bud five thousand trees for his exclusive use from the original stock.

Being very much interested in peaches, since that meeting I wrote each one who attended for an expression of their opinion of the peach, and sixty have replied, giving testimony that it should be introduced, one wants to sample it again; another says, we have enough white peaches; another says, yellow peaches have been planted too freely and more white should be planted, and one says it is not the peach he is looking for, yet about 98 per cent of those who saw the orchard and sampled the fruit sum it up by saying, it has many good qualities. It has size, shape, firmness, fine appearance and is worthy of a place. It fruited when others failed, is a money maker to be classed with the Ben Davis apple for profit and that it makes words unnecessary. The last touching clause from one is, "judicious cultivation, intelligent fertilization and careful management goes a long ways toward the success of a peach orchard."

Now, I ask, do we want to try this new fruit? It is true that too many plant too many varieties, yet few plant too few to handle them economically. Look for a moment at the advantage of varieties that suit the different localities. In the mountainous regions of Washington County, the Salway has been and is to-day one of their best peaches, while on the Eastern Shore of Maryland we do not attempt to grow them.

To name twelve varieties for the Eastern Shore, most of the up-to-date planters include the following varieties: Greensboro, Carman, Mountain Rose, Elberta, Reeve's Favorite, Old Mixon, Belle of Georgia, Fitzgerald, Moore's Favorite, Fox Seedling, Chair's Choice, and Crawford Late.

For the mountainous districts, they use most of the above varieties, with Smock, Geary's Holdon, Wonderful, Engle's Mammoth, Pickett's Late, Levy's Late, Crosbey, Salway and Bilyeau's Late October. Now, have we yet room for new ones?

APPLES.

Apples are attracting the attention of the fruit grower, as well as the farmer more than at any time in the past, as the apple has become a necessity.

Only a few weeks ago, I had the pleasure and honor of visiting Frederick Wellhouse, of Kansas, at his home, a man seventy-five years of age, full of enthusiasm on apples, and has now planted 1,635 acres. He is recognized as the successful apple king of the world, has made a financial success and from the earnest advice he gave on apple growing, made me feel that it was a great pleasure to be an apple grower.

He impressed upon me the necessity of system, keeping accurate accounts of what is expended and insists that the man who plants apple trees cultivate well the first five years and if he has push and vim to make his orchard self-supporting from the first year as Mr. Wellhouse does, cannot help but succeed. He succeeds best with the following varieties, named in order as to their value: Jonathan, Missouri Pippin, Ben Davis, Winesap, Gano, York Imperial, Maiden's Blush, and Cooper's Early. The last two named varieties have been dropped from his list in his last plantings.

He has marketed his crop as low as five and a half cents per bushel, while it has cost as much as 10 cents per bushel to pick and barrel them. His largest crop was in 1890, being 79,170 bushels from 435 acres. He prefers the high hills of the best soil for best success and such land costs him $50.00 per acre. Now he has made a reputation as a successful apple grower and is proud of his profession, which has helped toward his success.

I spent three weeks in the West, seeing where the apple seedlings are grown on the black bottom soils, where their nurseries and orchards are frequently overflown by water. While they do not use any fertilizer of any kind, their trees make a rapid soft growth and so do not go through the winter safely. I feel better contented with Maryland as an apple-growing State far in advance of any other State I could select, especially the rich hillsides of Washington County.

We have better apple soil, richer, cheaper, nearer the exportation port, cheaper labor and many natural advantages. We have in our State some of the most valuable apple soil the sun ever shone on. Our trees come in bearing at the age of from seven to ten years from planting, some a little earlier; they yield more per tree and live much longer than the western trees and are not subjected to being blown over by the winds. There is no reason for leaving the State to find apple land to engage in a profitable and delightful business.

About seventy-five per cent of the apple trees planted on the mountain regions of Maryland are York Imperial and Ben Davis, while Grimes' Golden, Missouri Pippin, Gano, Jonathan, Lankford Seedling, Mammoth Black Twig, Wine Sap, Stayman's Wine Sap, North Western Greening, Rome Beauty and Smith's Cider are planted in light quantities by many. Now the fruit growers are asking for an apple as productive as the Ben Davis with the quality of the Wine Sap or Grimes' Golden. Who is the one to find that desired new fruit?

PEARS.

There have been many new varieties of pears introduced. For quality probably none surpass the Bartlett, Seckel and Lawrence, for productiveness nothing yet equals the Kieffer, although the past season was almost a blank for this variety. The Kieffer seems to be less subject to disease and insects than others.

In pear we need that new fruit as productive as the Kieffer with the quality of the Bartlett. May we have it?

PLUMS.

Many have made fabulous sums on the plum on our peninsula the past season and the new variety attracting special attention is the Climax. The most profitable one of the extra earliest planted to any great extent is Red June and it is a favorite. The other varieties planted are, principally, Abundance, Burbank, and Wickson, while Ogon, Satsuma, Wild Goose, Willard, Normand and Shropshire Damson are planted in less quantity. Some trees of Red June and Abundance at four years old netted four dollars per tree. What seems to be needed in the new varieties of plums is one that will not rot so easily. Plums are easily grown but rather difficult to depend on until the money is in the bank.

CHERRIES.

But few venture to plant a cherry orchard of any size. While in Ohio, one of our customers told me his ten-acre Montmorency cherry orchard had been the past two years a paying investment, having paid the expenses on one hundred acres of land, both the purchase price and the expense of cultivation to date. He regarded Montmorency the best one for canning purposes yet the Early Richmond and Dye House are good ones. Some have found sour cherries to be profitable in this State but there is still room for improvements and new varieties.

STRAWBERRIES.

This is one fruit that no family should be without. There has probably been more disappointment from the introduction of new varieties of strawberries than any other nursery stock sold, because they make such a rapid increase and the fever of the color thrown before the purchaser is not forgotten until he fruits them and determines whether he needs them or not. New varieties of strawberries introduced has caused the season to be extended for several weeks, when about twenty-five to thirty years ago but few grew other than the Wilson. The two staple varieties planted to-day are Excelsior and Gandy; the former, though sour, is firm and ripens very early, while the latter is a very late one and for best success is usually planted on low, well-drained soil. Our Delaware friends say that Climax is the up-to-date berry for profit but other standard varieties are grown, such as Bubach, Clyde, Haverland, Nick Ohmer, Parsons, Sharpless and Tennessee Prolific. In Arkansas they write us that Early Hathaway and Louis Hubach are the coming early ones, but they are, as many others, yet to be tested. There is a demand for a new berry as productive as Tennessee and with better shipping qualities.

ASPARAGUS.

This vegetable is grown by few and varieties seem to be less regarded than most any other plant or tree grown. On our soils we find the Palmetto to be a very good grower yet the Giant Argenteuil is the most vigorous grower of all the varieties. In asparagus we could do with the varieties we now grow, yet if we expect to make progress we hope for a new variety to be an improvement over the old ones.

GRAPES.

The Concord and Moore's Early have yielded well the past season. I was in a vineyard during the summer when the grapes were being picked and a most successful grower said to me that the Moore's Early is the best of all the varieties for the money end of the business. He had a heavy crop and was handling them in a most satisfactory way to himself, which was to sell them at the farm, netting him four hundred dollars per acre. There is still a demand for a new grape that is productive and has better quality.

Summing up the situation on Nomenclature and New Fruits in Maryland, we have the ideal soil, labor and are in close proximity to the best markets of the world and near the exportation ports.

Let us plant new fruits as well as the old tested varieties and take the advantage of the opportunities we have in horticultural development in Maryland.

DISCUSSION.

Mr. Blessing: Have you had any demand for what is known as the German prune?

Mr. Harrison: Very little.

Mr. Blessing: A few years ago I planted the German prune. It bears every year. It sold for a better price than any of the others.

A Member: I would like to have Mr. Harrison give a little further information on the Climax strawberry.

Mr. Harrison: I simply refer it to my Delaware friend. Mr. Brown or Mr. Davis can better describe its merits.

Mr. Davis: The Climax strawberry is a strawberry that was originated in Wicomico County. I became very much interested in the Climax because the grower of the plants wanted to sell them, and did not want any money until the party, who came to the place saw that the statement he had made was correct, namely: he claimed 20,000 quarts per acre, and if his statement was not correct, you kept the plants and the money. I bought 30,000 plants, and feeling an interest in it, I drove thirty miles to see the berry in fruit. It was between the two rivers near Nanticoke Point, where the water is within about three inches from the top of the ground. I want to make a fair statement. I saw a sight I never saw before. I had grown 10,000 quarts. This man, I think, had 20,000. It was in black, sandy soil and the ditches full of water while a few miles back everything was burning for the want of moisture. If we buy the Climax strawberry and expect 20,000 quarts, we will be disappointed, unless we have every condition favorable to it. It looked very much as if every berry on the plants would make a good sized berry. The plants are robust, with large leaves, and if we have a good season and plant ten acres of Climax, we will get a tremendous amount. The berries ripen a little later than the Johnson and Wilson; with the seed on the surface of the berry, which indicates that the berries are good.

PACKING AND MARKETING OF FRUITS.

R. S. EMORY, COMMITTEE.

This subject is susceptible of such a wide range that I am somewhat puzzled to know where to begin particularly as to marketing. Further, it has been so thoroughly discussed by this association in the past, that it leaves little, if any, for me to add, in fact it is really a *personal* question. For many of us have but one market that we can reach without a great expense and trouble. Our Peninsula is so cut up by rivers and creeks that it is but a very short distance from any of our orchards to a steamboat wharf.

Assorting and packing, I think, is of first importance, if the fruit is picked too ripe or too green it can in a measure be corrected by careful culling and packing. I always make as many brands as the fruit demands, particularly with peaches and pears. I invariably make three sizes and frequently the fourth (the over-ripe ones). The first three we brand Extra, Prime and Culls and these are bought for canning, and the over-ripe ones by the market men for retailing at their stalls, and are frequently sold for the most money, as they are generally the largest and best colored. One great point obtained in this assorting is that the purchaser can get just the fruit he wants, and not be compelled to buy many he does not want to get what he *does* want. The first three sizes are usually packed in four-eighths bushel round peach baskets, the very ripe ones in the oblong veneer basket with a handle, making it more convenient to be handled by the marketmen and purchaser. In picking fruit we are invariably controlled by the point we ship to, both as to package and ripeness of fruit, some want it very firm, others not so much so. Therefore we have to cater to their wishes as much as possible.

The kind and size of package has been and is now giving us considerable trouble, and it is very hard to settle, for the reason that I have stated. Our factory has now discontinued making the five-eighths baskets; shippers using the four-eighths altogether, they say that they carry better and they get more in a car, making them more profitable. I used for the first time the past season for Kieffer pears, a basket holding from 1¼ to 1¾ bushels, with cover, a very convenient package for packing and handling, they were bought by parties to be put in cold storage. I shall very closely watch and note the results and hope in the future to be able to report very favorable results.

TRANSPORTATION.

J. P. BLESSING, CHAIRMAN.

This being an off year in some fruits in our State, notably a very limited peach crop, especially in Western Maryland, your Transportation Committee deemed it unwise to seek lower rates from the express companies, especially as the charges on all other commodities were advanced by the express companies operating in our State.

From an experience of five years as chairman of your Transportation Committee, I find it impossible to get any reduction in charges on fruit carried by the express companies. In my judgment, uniform and united effort by all the horticultural societies of the United States to agree upon a rate and a distinct classification for every variety of fruit and its action presented to all the express companies as a national request, would accomplish the desired result.

My associate on the Transportation Committee, Mr. W. G. Dawson, may be able to make a better showing regarding rates on local lines where fruit is delivered within our State. On lines, however, transporting our fruit beyond the limits of our State, whose schedules and classification are made up jointly about the first of each year, it unquestionably requires united effort by all the States interested to obtain any consideration.

The most serious complaint this season was caused by delays in delivering. My second quality of peaches had been selling in the New York market at $1.25 per 20 lb. basket when delivered on time during market hours. On Friday, August 21st, my peaches were not delivered in New York until Saturday evening; the market being over for that day, they were naturally held until Monday and sold for 35 and 40 cents per basket, a net loss of 80 and 85 cents on each basket. A similar delay occurred on September 9th, with about the same result.

As common carriers the railroad companies are unquestionably liable in cases of this kind, but inasmuch as individual effort involves so much labor and expense to enforce the contract, nothing is done, not only resulting in a financial loss to the shipper, but actually making the companies more indifferent and careless. If some means, therefore, for co-operative action by this association in cases of this kind could be devised whereby the express companies should be given to understand that they cannot run roughshod over us, thousands of dollars could be placed to the credit of the fruit growers every year, instead of enriching the railroad corporations.

This is a very important matter and effects every grower. Whenever a delay occurs in the delivery of fruit, there is not only a loss on that lot of fruit but it makes a break in the market price for several days afterwards. I know of one instance, in 1897, when we had a full crop of peaches, two days' shipments arrived together on the New York market, which resulted in a decline of one-half in price, and previous prices were never regained during the balance of that season.

W. G. DAWSON, ASSOCIATE MEMBER OF COMMITTEE.

At the request of the Chairman of your Transportation Committee, Mr. J. P. Blessing, I present a supplementary report, in order that Eastern Shore conditions may be brought to your attention.

The shipping facilities in our section of the State are far from satisfactory, and all replies to inquiries, sent out to the various counties, indicate a vast amount of discontent.

In the freighting line, it is found that our rates are considerably greater to Philadelphia and New York by rail, and to Baltimore by steamers than from, say, Norfolk, to the same points of destination. There are, I believe, some exceptions to this in steamer rates.

For instance, the rate on a barrel of potatoes from Norfolk to New York is 20 cents per barrel, while from points on the Delaware Division the rate is 35 cents per barrel. Again, the charge on a barrel of kale from Norfolk to Baltimore is 8 cents per barrel and it costs us 15 cents per barrel. These instances are mentioned in order to call attention to the fact that our transportation companies are not willing to put us on an equal footing with shippers at Norfolk and other points that are, to some extent, our competitors.

Yet the complaint of our people is not so much as to high rates, because the more serious fault of late deliveries occasions such heavy loss to the shippers. This feature has become most alarming, and we should, by all means, take proper steps to secure relief.

It can scarcely be doubted that these most adverse conditions may be changed for the better, if we will properly approach the transportation officials, and, in a business manner, demand the consideration to which we are entitled.

One more trouble lies with the express company (we have only the Adams in our section), and it is the inexcusably rough manner of handling our fruit at "the other end." Through the most careful oversight and untiring diligence of the general route agent on our Peninsula, it is the exception when our fruit is badly handled at receiving points. The cruelty occurs at destination. There the carefully packed crates of berries, peaches and other tender products are slammed around in such manner as to call forth indignation, and it surely causes the shippers a loss that is impossible to estimate.

As an associate member of this Committee, I earnestly plead that our Society shall take up these matters, and with due deliberation, determine upon a line of action that is conservative, yet firm, and persevere until we have such remedies as are the due of the most important industry of our State.

FERTILIZERS FOR ORCHARD AND TRUCK CROPS.

DIRECTOR H. J. PATTERSON, COMMITTEE.

Ladies and Gentlemen of the Maryland Horticultural Society: I was not aware that I was appointed on this Committee or that I would be expected to say anything upon the subject until a few days ago when I received a program from your Secretary so stating, accompanied by a letter in which he asked that I would emphasize more particularly matters of interest and relating to the fertilization of truck crops. Since receiving this notice I have not had time to prepare a formal paper; but have gone over the literature giving the results of recent experiments upon this subject, and, as our time is short and you still have a number of papers to be presented, I will make my remarks brief and try to give you a synopsis of the results of the experiments and particularly of those points which we can apply.

The question of the fertility of the land is always full of interest and I suppose will ever be so from the fact that poor soils, like poor people, are always with us and always will be.

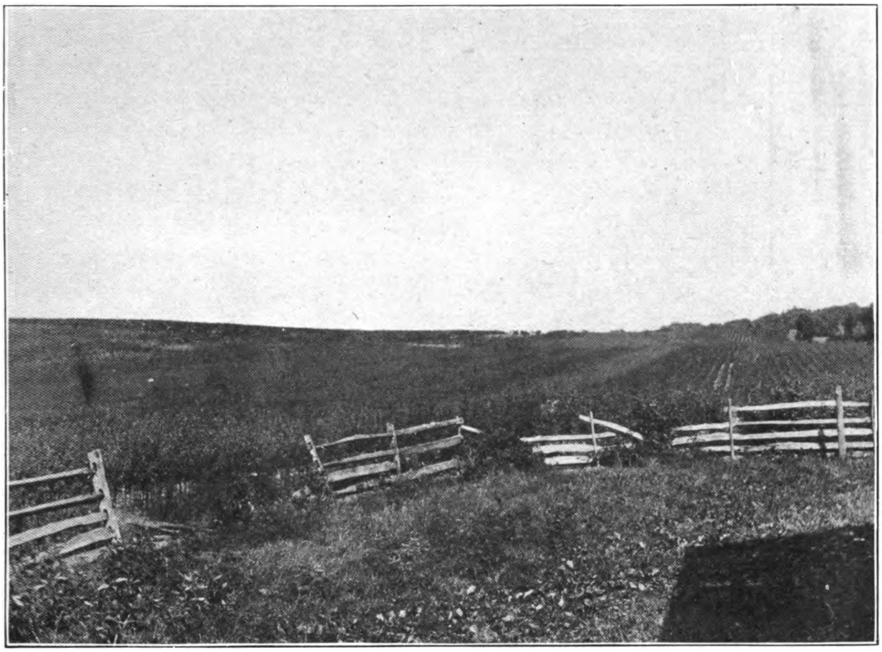
The experiments conducted with both orchard and truck crops are rather few in number and many of them indefinite in character, so that little is really known upon this subject and the practice which is followed with these crops has been brought about by reasoning from analogy using the results of experiments with the staple farm crop as a basis.

During the past few years there have been a number of experiments conducted with the use of commercial fertilizers for supplementing stable manure for truck crops. In this connection, the work of Bernard Dyer, of Rothamsted, is worthy of particular note. The results of all experiments on this subject points, with very few exceptions, that better and more economical results can be obtained by using only about one-half as much stable manure as is commonly used and supplementing this with commercial fertilizers.

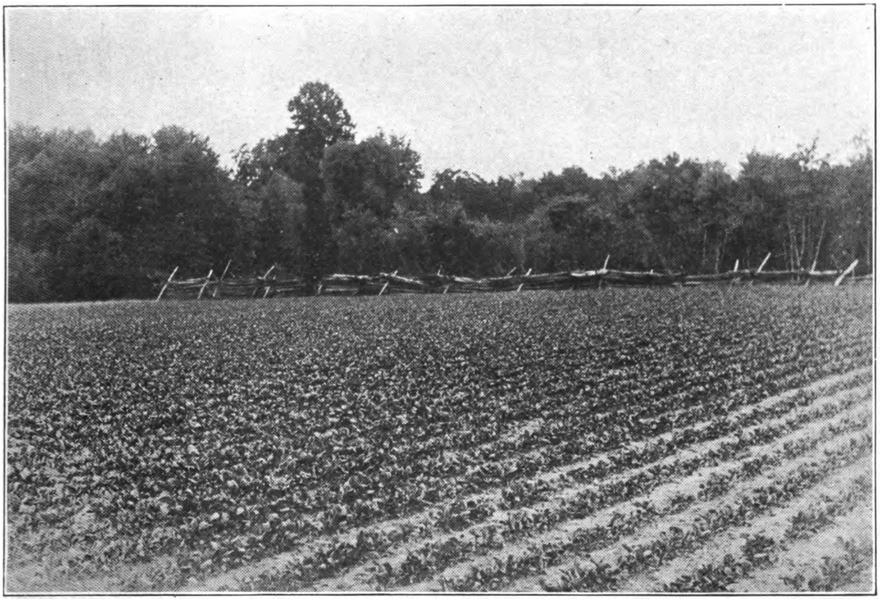
It has been a practice with the growers of vegetables and small fruits for many years to rely almost wholly upon stable manure. This is particularly true of those living near the large cities where stable manure can be gotten in abundance. While all recognize that stable manure is good, yet there are circumstances when it does not supply all that is needed and even in the most favorable situations it is generally quite expensive. So if the truck grower can do anything which will give him better and more economical returns it should be his aim to adopt such methods. The principal value which stable manure has over all other fertilizers is that it contains such a large proportion and bulk of organic matter. This organic matter exerts a very beneficial effect on the mechanical condition of the soil and aids much in the conservation of moisture, and from this standpoint has much value; but careful experiments have shown that these valuable results could be gotten by the use of only one-half the amount of stable manure and then supplementing the plant food by commercial fertilizers, and that as large and even larger returns could be gotten and at less than one-half the cost. Not only has the yield been as good or better but the quality has been in all cases superior. This is a point that truck growers do not pay enough attention to. The consumer is constantly becoming more critical as to the quality of the product. A good product increases our markets by increasing consumption. If a person gets good tender radishes, beets, celery and kale they will consume large quantities, and come back day after day for them; but if the first purchase is tough and inferior a little goes a long way and the purchaser does not come back soon again. Consequently, look well after quality, and commercial fertilizers, properly used, will be found to have a marked influence on this property. On most soils phosphoric acid, as supplied by dissolved rock, bone, tankage and fish, will be found quite necessary and will have a marked influence in increasing yields. Nitrate of soda will be found to be more influential than any other fertilizer in causing a rapid growth and, hence, with most vegetables, will make a more tender and better quality. It also has much influence in increasing the yield.

Potash exerts a beneficial influence on many crops by giving a superior quality and in most of our tidewater soils will increase the yield. Potash in the experiments conducted seemed to exert a specially beneficial effect upon Globe and Jerusalem artichokes, carrots, parsnips, and spinach. It also was found better for late cabbage and lettuce than for early. Onions also seemed to respond especially to potash fertilizers. Kainit proved to be much better for asparagus than salt. Nitrate of soda on rhubarb and garden peas gave better yield, increased the earliness and made them sweeter and better flavored.

Our horticultural department has been conducting some experiments upon fertilizing cabbage which, I think, has particular interest. The experiments considered the time and way of applying stable manure and commercial fertilizers as well as a comparison of the same. The results showed that if the fertilizer or manure were applied in the spring to a sod so as to get the effect on the sod and then plowing this sod down for late cabbage, that much better results were obtained than by applying the fertilizer or manure either just before or just after plowing and immediately before setting the crop. These results correspond to those we have obtained in the use of fresh stable manure on staple farm crops. The experiments at our station on cabbage gave the largest yields with commercial fertilizers applied



Portion of 500-Acre Field of Peach and Apple Nursery Stock.
(Franklin Davis Co.).



Part of Field of Over 1,000,000 Cabbage Plants.—Richard Vincent,
White Marsh.

in the spring to sod to be plowed down in the summer for fall or winter cabbage. These tests have been running two years with the same results both seasons; but as both these years have been abnormally wet, the stable manure has not had a chance to exert its influence in conserving moisture. I believe that for many truck crops that the manure could be applied in a fresh state some time before planting with better and more economical results; thus much labor could be saved in forking the manure over and there would not be so great a loss of plant food. Of course we all know that fresh manure will make some vegetables, particularly root crops, of inferior quality and rough and stringy. In such cases it would be best either to use rotted manure for these crops or apply the fresh manure some time in advance and to the previous crop.

There are soil conditions which have recently come to our attention which are of special interest to truck growers. The thing to which I refer is that there exists in our tidewater areas a condition which might be termed alkali soils. While this condition is not true alkali and not just like the alkali soils of the arid West, yet we have some soils in this State which contain more soluble salts than exist in many of the alkali soils of the West. The extent of these alkali areas in Maryland have not been determined, but I would not be surprised if this condition is quite widespread and covers considerable areas. The effect of these soluble salts in the soil is quite marked with some crops under some conditions. It has come to our attention, particularly in connection with growing celery, providing a sort of club-rooted condition; yet it is not the club root disease common with many plants. So far experiments seem to show that the bad effect of these alkali salts can be corrected by the use of carbonate of lime, such as is easily obtained for use from finely ground oyster shells. The carbonate of lime seems to be more effective than caustic or burnt lime. We have taken up an extended study of these so-called alkali soils of the East in our chemical laboratory and we should be glad to have anyone who suspects this condition to communicate with us so that we may get at the extent of the area in this State.

As I treated the subject of orchard fertilization two years ago before this Society and what I had to say is printed in your annual report for that year, I will not take more of your time now to repeat anything on that phase of the question, but close at once so that you may have the time for the other topics on the programme.

Reports of Special Committees.

BALTIMORE FRUIT EXCHANGE.

PRESIDENT R. W. SILVESTER.

Data has been collected from several sources all of which tends to demonstrate the desirability for such an organization. Those existing in certain States such as California, New Jersey, New York and the eastern shore of Virginia are factors big with good results to those who patronize them. With such a central organization in Baltimore, with branches on the Eastern Shore of Maryland, and in Western Maryland, properly manned, it would be difficult to forecast the beneficial results which would accrue to those who join hands in such an enterprise. It is well known that at times during the fruit season in Baltimore the market is flooded with fruit not only from Maryland but from southern and western sections. Men with business foresight embrace such opportunities and buy at Baltimore quotations and sell in northern and western sections at prices which yield handsome profits on their investments. A well-conducted fruit exchange would place this gain in the hands of the producer where it properly belongs.

In the report for your next annual meeting I hope your Committee will be able to present for your consideration something of the details of such an organization.

Reports of Officers of State Horticultural Department.

REPORT OF ACTING STATE ENTOMOLOGIST.

PROF. T. B. SYMONS.

The work of this department the past year has been somewhat embarrassed by the resignation of Prof. A. L. Quaintance, State Entomologist, last April, and also of Mr. R. I. Smith, Assistant Entomologist, last August. It is needless to say that a change in the personnel of a department tends to retard its progress for the time being, however, notwithstanding the above, the work of the department has been carried on very successfully and it is with pleasure that I, a Marylander, who has a deep interest in your progress, report as your Acting State Entomologist. From the fact that the people of our State engaged in agricultural as well as other varied pursuits are continually advancing in knowledge, and learning by past experiences that in order to make a success of any one thing, they must make a thorough study of it in relation to the whole system by which it is affected, and I am glad to say in this connection, realizing more fully the importance of knowing how to control injurious insects.

The work of the Entomologist during the past year differs little from that of previous years, as there have been no marked unusual demonstrations by injurious insects except in the case of a few species which will be discussed at length in the report of the Committee on Entomology. The usual depredations by the San José scale in sections of the State where the orchardists have not as yet held it in control have been apparent and it may be safe to say that there are many orchards in the State which will be destroyed by the insect if they are not given immediate attention. Nevertheless, I am pleased to state that in many sections of our State the insect is in complete control and this has been brought about principally by the use of the lime, sulphur and salt remedy which has proven to be a most satisfactory treatment for the pest. It is not necessary for me to discuss this wash in this report as circulars have been issued setting forth its efficiency and a bulletin is now in preparation discussing the results of the experiments which your department has undertaken. Infested orchards in different sections of the State have been treated under the direct supervision of the department both last spring and this fall. It is thought that demonstration orchards in an infested locality proves to be the best method by which to show the orchardists how the insect may be controlled. It is my intention to extend this work all over the State. It is needless to say in this connection that much time of the Entomologist and his assistants has been devoted to this work and in experimenting with different insecticides to find the best remedy as regards cost and effectiveness for the pest.

The manner of inspection of those districts where the fruit interests are most important by local inspectors, has been carried on with a degree of success; it has been our aim to inspect those sections of the counties which have not been inspected heretofore, and as a consequence we have had an enormous number of new records of infestations to add to our list. It is not necessary to say that we do not expect to eradicate this pest, but with the remedy at hand we can reduce its ravages to a minimum. The sentiment which many of our orchardists have expressed should be and, I trust, will be by you all, that, of not fearing the San José scale more than any other injurious insect but realizing that when you plant an orchard, if the San José scale should appear you know how to and will control it.

I herewith submit in tabulated form a list of the counties showing the number of each kind of trees that have been inspected and the per cent that are infested with the San José scale.

TABULAR SYNOPSIS OF INSPECTION WORK FOR 1903.

COUNTY	No. of peach trees inspected.	No. of apple trees inspected.	No. of pear trees inspected.	No. of misc. trees inspected.	No. of trees infested with San José scale.	No. of premises or orchards inspected.
Anne Arundel.	37,724	6,535	4,055	1,375	9,939	80
Baltimore	5,583	5,583	5,583	....	330	14
Carroll	3,565	1,300	230	216	164	29
Caroline	26,400	2,425	1,600	125	5	69
Dorchester....	77,509	14,660	1,000	....	4,361	380
Frederick......	60,556	26,345	2,327	2,403	10,055	664
Harford	23,634	5,789	4,279	4,620	923	136
Kent..........	50,500	60	3,300	135	41,264	16
Queen Anne...	44,795	2,790	10,210	....	2,641	106
Somerset	3,759	3,759	3,759	3,684	....	49
Talbot	20,137	6,586	1,701	374	2,810	154
Washington ..	247,760	31,400	5,760	4,545	38,589	335
Total	601.922	107.232	43,804	17,477	111,081	2,032

It will be seen from the above that the total number of various kinds of trees inspected during the year amounts to 770,435 and of this number 111,181 or about 15 per cent are infested with San Jose scale. This of itself verifies the above statement that the orchardists in many parts of the State must fully realize that in order to protect their interests in orchards they must employ remedial measures against the pest. The majority of the orchard inspecting has been done by local inspectors who have aided much in disseminating information among the individual growers. They come in personal contact with them in their orchards and can therefore point out infested trees and give a plain talk as to treatment. During the last month over 2,600 letters have been sent to growers whose premises have been reported as infested with scale, explaining the seriousness of the ravages of the insect and recommending treatment for the same. It is encouraging to state that we have received numerous replies signifying their intention to treat their trees with the lime, sulphur and salt wash. While the local inspectors have done satisfactory work, it has been suggested by prominent fruit growers that more money should be secured from the State in order to provide for the constant employment of properly qualified inspectors for each county who will look after these growers and give them instructions in the practical work of treatment. Also they could keep in close touch with each infested orchard. There is no doubt that in this way much more work can be accomplished in controlling this and other injurious insects and diseases.

As usual the inspection of nurseries in the State has taken up a considerable amount of time. This, of course, was done conjointly with the State Pathologist and our assistants. We have been particularly careful as far as possible to see that no infested stock will be shipped out and I may add that the majority of nurserymen in the State have been willing to carry out our wishes in the destruction of infested stock.

The office work of the department is constantly increasing both in correspondence and in filing records. In the correspondence hundreds of specimens have been received for determination and inquiry made for information in regards to insects. This demonstrates that the growers are becoming more inquisitive and are thereby gaining a greater amount of information along the numerous lines which will aid them in progress. There is probably no more satisfactory method of giving information on specific points than by letter. Our card catalogue system enables us to ascertain at any time the condition of an orchard in any part of the State, but to be useful, however, these cards must be kept up to date and this requires a great amount of clerical work. The department has continued its series of circular publications on timely topics.

Much time has been devoted to the preparation of a collection of economic insects. Thirty-six cases were prepared and exhibited by the Experiment Station at the majority of the county fairs in the State. This attracted much interest on the part of visitors at the fair and numerous questions were asked as to the control of the injurious insects. Investigations and life histories of several species of injurious insects have been carried on in our laboratory, together with the work of preparing the permanent collection of insects.

In conclusion I wish to extend my sincere thanks to the orchardists of the State for their encouragement and support in the prosecution of my work, also to President R. W. Silvester and Director H. J. Patterson for their hearty co-operation and innumerable courtesies toward me and this department.

DISCUSSION.

President Kerr: Any remarks on the report are in order.

Prof. Symons: I have a report here on the miscellaneous insects of the year, but I hardly think it is necessary to read it. I would therefore rather take up this time to ask the members to state what insects have been most injurious in their respective localities and also report on remedies for the San José scale, and especially on the lime, sulphur and salt wash.

President Kerr: Any member that has any special report to make in regard to depredations or unusual increase of insects, will be gladly heard now. Is there any special locality that you would like to hear from?

Prof. Symons: No, sir; not particularly, but would like to hear from all over the State.

President Kerr: Mr. Balderston, how is it in Cecil?

Mr. Balderston: Well, the scale is there, but not increasing rapidly. Now about other insects. You cannot get the people to use spraying apparatus. Their orchard interests are not of sufficient size to warrant them to buy spraying outfits for their own use, and thus they are mostly neglected and not cared for as is necessary. An outfit to be used with a horse would do much good, and if it would be possible for the State to have stationed an apparatus to use, and have a man to make a business of just spraying for insects, it would seem to be a good thing. One man could do much with a steam power outfit, which will spray several hundred acres in a short time. The present method is very inefficient and slow, and it must be done to control the San José scale. One spraying outfit could do an immense amount of work, and could be hired or rented to those who have not the means to buy one.

President Silvester: If Mr. S. S. Stouffer is present, I would be pleased to have him repeat to the members of the Society what he said at a meeting of orchardists and nurserymen at the Carrollton Hotel not long since. In these times beset with a disposition to lie down before the difficulties attending fruit culture incident to insect pests and plant diseases it is refreshing to hear men express themselves as having no fear of the extermination of their business so long as our scientists furnish them with means as efficacious as those which have been given them for the control of the San José scale.

Mr. S. S. Stouffer: In listening to my neighbor's remark, the first trouble will be to get the farmers to realize "where they are at". When they once realize that it is an absolute necessity, and will pay them to spray and keep this pest in subjection or control, I think it then will be possible to hire an outfit for spraying, as you do for thrashing to-day. The time, at least in Western Maryland, between cold weather and the growth of foliage, would give one with an outfit too short a time to do much work. However, the expense is not necessarily great. Engines are nearly always located in all neighborhoods, and a good many could profitably use a traction engine. I think one of the first things is to get the people to agree to it and then have a man to go around and clean up their orchards. There is no question as to the control of the scale, if it is properly followed up. The application, however, is rather troublesome. Of course in taking a large outfit, they could do it speedily, and the parties would become efficient in it, the same as an outfit for thrashing; and it is possible much good can be done in that way.

I don't think it is practicable for the State to do the work for the individual farmers. One of the greatest needs is for each individual orchardist to do the work himself. The chances are rather poor if we wait until outside help does our spraying.

Mr. Blessing: Along that line I agree with my neighbor, Mr. Stouffer, in some points, in other respects not entirely, and with the gentleman from Harford County.

A very important matter for discussion is, What legislation do we need to protect our orchards from the inroads of the San José scale and other enemies that now threaten to annihilate horticulture in our State. Gentlemen, I am no pessimist, but I assure you that the conditions which confront us are alarming. Notwithstanding all our efforts to check the increase and spread of the pernicious San José scale, they have multiplied and have been distributed until nearly every fruit tree in the State is affected, and many large orchards are ruined beyond hope of recovery. In only a few orchards has the scale been kept under control, where the owners were on the alert and equipped with suitable spraying outfits, and used them at the proper time and thoroughly. But not one fruit grower in every hundred has any means of combating them. Consequently, they remain unmolested from year to year and have multiplied until there is no room in the tree for another scale to locate. The wind and birds are carrying them to other orchards and even our forest trees are now becoming infested.

That the San José scale can be kept in subjection I am convinced, because I have practically exterminated them in an orchard of my own. But the small growers will not take the trouble or go to the expense of procuring an outfit to spray with. Others do not recognize the danger, while many others do not know with what to spray. Now, gentlemen, I have made it a point while inspecting orchards to inquire of the owners their opinion regarding State aid, for the suppression of the scale. And in every case they favored such action, they are willing and anxious to pay the expense of having the work well done, rather than undertake the work that they do not understand themselves.

So the only solution of the problem that I can conceive to be effective, is for the State to equip a number of spraying specialists in every section of the State infested with scale, with suitable apparatus for doing the work rapidly and thoroughly at the proper time, with the most effective insecticides. This would require but a small additional expense to the State for spraying apparatus. The actual work being paid for by the horticulturists. Of course those who are equipped for the work, and who prefer doing their own spraying will not be interfered with by the State sprayers. But it will make spraying general and reach every orchard so that none escape, to remain breeding grounds for scale and other injurious insects. Besides, this plan would relieve the State Entomologist of orchard inspection, as the scale has now been located in every young orchard inspected in the territory allotted to me and 95 per cent of the old orchards are in the same condition.

Mr. Ramsdell: I would like to ask the gentlemen if they have tried the caustic soda as a substitute for the lime, sulphur and salt. I have noticed mention of this mixture, and saying that it was superior to the other. Does anyone know anything about it?

Prof. Symons: I anticipated this question being asked at this meeting. I presume the article to which the gentleman refers is the one that is published in *The Farm Journal* for January. In reviewing the article: the author states "that the wash kills an hour after application," and that "the lime, sulphur and salt is no longer effective after a rain."

We applied the caustic soda, 94 per cent at the rate of one pound to seven gallons of water, January 1st, and I examined the trees yesterday, [January 14th, 1904,] and find in comparing the per cent of insects alive before treatment and after treatment that there is about 50 per cent killed at this time. Of course, I cannot say what further examinations will indicate, however, the article above referred to states that the wash does its work an hour after treatment. At this time I would not recommend the use of caustic soda alone as a wash against the San José scale. Further, we have proven by experiments that apparently 95 to 98 per cent of the scale can be killed by a thorough application of the lime, sulphur and salt wash. I know of a demonstration orchard on Taylor's Island, which was badly infested with the scale and which was sprayed thoroughly with the lime, sulphur and salt wash last March. which is comparatively free from the insect now. A close examination of a majority of the trees revealed one live scale.

Allow me in this connection to mention my views as to Mr. Blessing's remarks. Of course, there are a number of infested orchards in his section of the State, but he stated that the scale had been controlled in one orchard. I would like to ask him how it was controlled?

Mr. Blessing: I first removed all badly infested trees. I then topped the balance back and washed the stumps with strong whale oil soap, two pounds to the gallon, as well as it could be done, with a whitewash brush.

Prof. Symons: Gentlemen, it is a very easy matter to get a remedy that will kill the San José scale, but what we want is a remedy that is first, efficient in killing the scale; second, that is not injurious to the tree when applied in the dormant state and third, cheap enough that the cost of spraying an ordinary sized tree will not be more than two or three cents per tree. Whale oil soap costs about five cents a pound and it will take at least one gallon of the wash for the average sized tree, and the solution should be of the strength of two pounds to the gallon of water, when applying it when the trees are dormant.

Mr. Blessing: It took nothing like that quantity; because we cut the tops off, and therefore a gallon went a long way.

Prof. Symons: The scale should be treated before the tops of the trees are dead. The lime, sulphur and salt wash has been made for about 2½ cents a gallon. In providing yourself with equipment for spraying, you first have to secure a pump, and for a good sized orchard a barrel pump should be secured. These can be bought for various prices according to the make of the pump. We will say that the cost will be about $18, but it will last ten years if properly handled. Anyone can have a vat made out of wood and lined inside and out with galvanized iron. This should be set on a brick base with sufficient space underneath where a fire can be made. This can be made and set up for less than $10. Or, one can secure a cooker for about $13. You have now expended about $30 for apparatus. But mind you, this will stay by you for years if properly taken care of.

If the State should have spraying equipments in many localities, I have no doubt that the cost of employing the equipment to do your spraying would soon exceed $30. Again not only is your pump useful for spraying fruit trees but it can be used to an advantage for other work, likewise is this true with the cooker or vat.

Another difficulty which would arise if the State furnished equipment for spraying in the many localities is, which orchard would he equipment go to first, and next, and so on? It would be worse than it is now in some places with the thrasher and engine, "Which farm is the thrasher going to first and when will it come to mine?"

Again in spraying fruit trees with lime, sulphur and salt it should be done, if possible, in early spring before the buds swell; you recognize what a short time this equipment would have to do all of the spraying in a neighborhood. Therefore I cannot see how it would be practicable to have a spraying equipment to go over a whole district.

It would be well, however, for two or three growers to club together and purchase such an outfit. It would not come so very heavy for each one, and they would always have it for use when wanted. They could, by mutual agreement, specify the time that each one should have to treat his trees.

Mr. Hartshorn: I only want to say that it was long before the San José scale was invented that I made a preparation of the lime, sulphur and salt wash to improve my orchard, and whitewashed the trees with the same. It was very successful. It was also very simple, and I got the heat by slacking the lime. It gave sufficient heat to make all I needed. What it would do for the San José scale, I cannot tell.

Prof. Symons: In making the lime, sulphur and salt wash, without boiling—it can be done; but I would not recommend anyone to use it. It may be effective to a certain extent, but there will be a better solution, and, no doubt, better results by boiling. The more you boil the mixture, the better combination you obtain. It is necessary to form the sulphides.

I will say that the salt does nothing in killing the insects, but it is added simply because it is thought to make it stick to the tree better.

In the *Farm Journal* the gentleman states that the lime, sulphur and salt wash does not kill quickly and it loses strength after two or three rains. I would like to say that Professor Quaintance made a report at the meeting of the Association of Economic Entomologists, in Pittsburg, in June of 1902, that the lime, sulphur and salt wash was not effective and that it only killed 50 per cent, and that has been reported heretofore. Professor Quaintance made examinations after that in July, August and September, and by that time he found that 95 per cent, and in two or three instances, 99 per cent of the scale was killed. The *Farm Journal* states the whitewash only is left on the tree, and that it is not effective. We have determined that the lime, sulphur and salt is a slow insecticide and that the sulphides on the tree are continually leaching out through the rains, and will apparently kill the young scale as late as September.

In regard to making it cold, the entomologists do not advise it. New York State has taken up extensive experiments, and they show in some cases that it has been effective and in others not. It has been the consensus of opinion that when it is applied hot it is very effective. As a matter of fact, it is not applied hot, for when it is scattered through the small nozzle, and strikes the tree, it is practically cold. We recommend applying it warm, because it goes through the pump better. We will make the wash for you to-morrow morning in the other room.

A MEMBER: Referring to this matter of making it cold, I read of an experiment by an orchardist. He tried it first with sulphur and salt, and afterwards by slacking the lime. He said one way was just as effective as the other.

DR. VON HERFF: The important point is that both have to be done. It has to be done every year. Again, it has been said that only one scale has survived. I do not think it was necessary to spray again.

PROF. SYMONS: I don't want to have inferred that if you spray one year that you don't have to spray again. However, if you give your orchard a thorough spraying one year, I think it may be possible that you can let it go over to another year.

MR. STOUFFER: Last spring I did not finish my spray work owing to the early season. Leaving about 500 Ben Davis apple trees not sprayed. On these trees the scale has increased very fast, injuring the fruit, making it almost unsalable and injuring the trees to such an extent that I lost $30 for every dollar saved by not spraying. The coming spring I will use all of the time suitable for the work and expect to cover the entire orchard.

PRESIDENT SILVESTER: You think it is just as necessary to spray as to plow your corn?

MR. STOUFFER: Yes, unless the trees are free from scale and perfectly healthy.

PROF. SYMONS: No doubt it is practical to spray every year. You want to do it as perfectly as you can, as it is only by this means that the scale can be controlled.

Another point, it is effective in controlling leaf curl. In some varieties, especially with the Elberta, leaf curl has been very injurious, and it has been determined that the lime, sulphur and salt wash will control it.

PROF. NORTON: In regard to the use of this for fungi, it is a partial preventive on such fungi as start in spring, such as scab and leaf curl. It won't do very much for the peach rot. It can't be depended on for fungi that appear later in the season.

MR. STOUFFER: I think that an application of the lime, sulphur and salt wash will help bitter rot. I believe it helps to retard the spreading of the same.

Prof. Norton: It doubtless does.

A Member: But in my readings I found an idea and that was putting in a pound or so of caustic potash. I want to know if this addition would be beneficial in the mixture against the scale.

Dr. von Herff: I do not think it would be at all beneficial nor even desirable, to add any caustic potash or caustic soda to sulphur-salt-lime mixture. One effect of such addition would be to make the mixture more objectionable to the workmen who spray, and more destructive to the apparatus used.

Prof. Symons: It has been stated that both caustic soda and caustic potash have been used without success. With regard to potash and soda there is practically no difference.

President Kerr: I think we have a gentleman present, a chicken of the Blue Hen, who has had some experience with the lime, sulphur and salt wash, etc. Mr. Dickson, I think the Society would like to hear your experience with that combination.

Mr. Dickson: Mr. President, I cannot speak from experience with the use of the lime, sulphur and salt wash because I have so far had no scale, but do not expect to be long exempt from it. All that I know of this wash has been from observation of my neighbors and the one who has used it most successfully, in fact, the first one who used it with us, has always mixed it cold and is on the floor and can explain his methods, from personal experience. Now, in this matter of spraying, I think that having it done by State aid or one outfit for a community, is better, theoretically, than it could possibly be practically. The basic principle of spraying is to know when and why. When this is fully understood, each one of us is equal to the how. If we had nothing but scale, one general outfit in a community might do, but with the many insects and fungous diseases we have to combat, the idea of depending on some nomad like our thrashing outfits, to come and spray for codling moth, for instance, which must be done just as the blossoms are falling in order to get the poison in the calyx before nature closes it and have him get around a couple of weeks too late, is worse than nonsense. I fully agree with you, Mr. President, where your admirable address speaks of the nightmare caused by San José scale, but basing the assertion on the experience of a fruit grower in our locality (Mr. Bancroft), who had a bad infestation of scale, but who met and conquered it and this year harvested a handsome paying crop of apples from those same trees, I think it a mistake to become terrorized and a little spraying of the orchardists as well as the orchard would be helpful.

PRESIDENT KERR: Have you any combination or mixture to spray the orchardist that you can recommend?

MR. DICKSON: I admit that I hinted a more complete knowledge of nature's law of spontaneous growth when not checked by environments and natural enemies, will lead us to spray our trees and make them germicidal on the same principle that the surgeon uses antiseptics, to make a wound germicidal and let nature heal it. This will, I think, settle the spraying problem and each one of us will do it for ourselves at the proper time and in the way that best suits our several conditions. We will then brook no interference from governments and unreliable machinery knights of the road. Mr. A. N. Brown, of Delaware, is the gentleman I referred to. He is here and can explain his own methods.

PRESIDENT KERR: Mr. Brown, we will be pleased to hear from you.

MR. A. N. BROWN: I can give you my experience, if that is what you wish. I have been quite successful in destroying scale, probably I had the second worst infested peach orchard with San José scale upon the Delaware and Maryland Peninsula. The worst infestation was across the road from me. The scale has now gone to my apple and Keiffer pear trees. I have used the oils some but have been fearful of them. I remember while a boy by an experience of my father that coal oil was death to all forms of vegetable life. It will surely kill any tree to which it is applied if continued long enough.

Three years ago I began the use of the lime, sulphur and salt wash, against the advice of our State Board of Agriculture and followed strictly the California method of preparation for two years. I boiled and prepared every gallon of this wash myself that I have ever used. I have stood in the orchard for hours with nozzle in hand applying the mixture. I have watched every detail and know results and can say that in two applications I have destroyed the scale in my orchards without losing a single tree or branch and you can examine it under the glass and you will not find any scale or any other insects or fungus on the trees. I know that sounds like boasting, but the orchard is where you can get at it, I invite you to examine it if you wish.

As already stated, I used the California method, boiling 1½ hours, but I was not satisfied with the combination, besides it was very tedious. With all the boiling I gave it, it would not stand over a few hours without separating and the residue with all this boiling was much more than what I should have had. I therefore made some experiments of my own and finally hit upon a method that is very satisfactory and leaves me less than a pint of dregs after spraying out a barrel of 60 gallons. The old method would always leave several quarts.

My method of preparation is as follows: First, I take 20 lbs. sulphur, (flour of sulphur) and 2 gallons of boiling water and make a sulphur paste by adding a little of the water at a time to the sulphur stirring it well during the process, by the time you have the water all stirred into the mixture, the sulphur is not all dissolved because this cannot be done, but I have broken up the globules of sulphur into most minute parts, so that it can be taken up and perfectly distributed in the lime. This fact is indicated by the bursting of these globules of sulphur showing that I am making them smaller.

Second, I take a common sugar barrel, put two wire hoops around it, put into it 40 lbs. of the best stone lime obtainable, pour on it 12 gallons of boiling water, immediately add the sulphur previously prepared, cover the barrel with a burlapp sack and let boil for 20 minutes. It is essential that you work rapidly as any interruption of the slacking process may destroy the effectiveness of the wash. I do not stir during the boiling process, only with an ordinary garden hoe occasionally raise the lime from the bottom so that it will not settle and burn before it is thoroughly slacked. After boiling ceases I add 46 gallons of water (warm preferred) and, finally, the 15 lbs. of coarse salt, stir well, strain into the spray tank with a strainer 30 meshes to the inch, and apply while fresh and warm. This wash is more effectual if applied when made than if left stand. This wash is adhesive. I have no trouble in that direction, as the wash applied last February is now plainly visible. It is stated the salt adds no value to the wash, but I shall be very loath to leave it out. I may add some blue stone hereafter about 1 lb. to every 20 gallons, as I believe it will add to the adhesiveness of the wash and will strengthen its value as a fungicide. I do not believe that caustic soda added is any improvement, at least experiments along this line have not shown any beneficial results.

As I have already stated I have killed the scale and other insects harboring upon the surface of the trees as well as the various forms of fungi. Those persons having purchased the Kerowater pumps and spray motors, will have no further use for them as such. In my neighborhood I think the lime sulphur and salt wash is now pretty generally regarded as the only safe and effective remedy and will be used instead of the oils until something better appears. The scale is pretty generally distributed throughout my locality. The orchard of my neighbor and my own are separated only by the public odar and therefore afford an excellent opportunity for the comparison of the two methods used to control the scale, viz: the oils and the L. S. S. wash. My neighbor's orchard was sprayed with a mechanical solution of crude petroleum, 20 per cent strength, under the directions of the present State Board of Agriculture, while I used the L. S. S wash. The entire tops of the trees of my neighbor's orchard were killed, while I have lost none. I sprayed my trees from four sides, covering them completely, my neighbor cut the dead tops out of his trees and a new and vigorous growth of shoots have formed, which I think the owner will spray the coming spring with lime, sulphur and salt. He intends purchasing another pump, discarding the Kerowater, and hopes to renew and save his orchard, which, I believe, he can easily do, because he cut out the dead wood on his trees before the trunk had died. Should he use oil on this new growth as before, I feel quite sure he will kill the orchard entirely.

A MEMBER: Is it hot water that you used the second time?

MR. BROWN: I use 2 gallons boiling water to make my sulphur paste, 12 gallons to slack my lime, then fill to the required 60 gallons by adding 46 gallons of cold water, although if slightly warmed it would be preferable. My experience is that best results follow when this wash is made just when you wish to use it and used as soon as made. While at Geneva, N. Y., last week, Prof. Parrott, of the Geneva Station, stated that the addition of caustic soda to the L. S S. wash was no direct benefit, but that the soda of itself, 10 pounds to 40 gallons of water would kill the scale.

MR. TOWSON: Do you have to strain it or do you make it right in the barrel?

MR. BROWN: I make it in barrels and strain into the spray tank from the barrels.

MR. W. W. COBEY: Won't the Kerowater pump do as well, if the oil tank is taken out?

MR. BROWN: I see no objection to it, and believe it can be used when the oil tank is removed.

MR. TOWSON: You want an agitator to work all the time, do you not?

MR. BROWN: I use a "Friend" pump which is not supplied with an agitator, the boy driving the team in the orchard does all the stirring required. This pump costs more than others, but has more power and is more easily operated. A boy does the pumping, with two discharge hoses and four or six nozzles. In my method of mixing the material does not separate as readily as when made by the California method. In conversing with J. H. Hale some time since, he told me that he had sprayed 60,000 peach trees in his Georgia orchards with oil with success, he ran six pumps, but kept an expert with the pumps and tested each one of them every 15 minutes to maintain the solution of proper proportions. His neighbors not exercising these precautions lost their trees by the thousands. In Mr. Hale's Connecticut orchards he used the L. S. S. wash and the oil, and was so pleased with the results of the L. S. S. wash that in the future he will use nothing else. He purchased three carloads of sulphur last week for his spraying purposes this spring.

I have a neighbor who, last spring, had the finest six-year-old peach orchard I ever looked at, there was some scale in it. He procured a spray motor, applied oil 20 per cent and he has badly injured the orchard. He tells me that there are places in that orchard where he has lost two dozen trees in a single block. The danger of using the oil has left a sad impress with him.

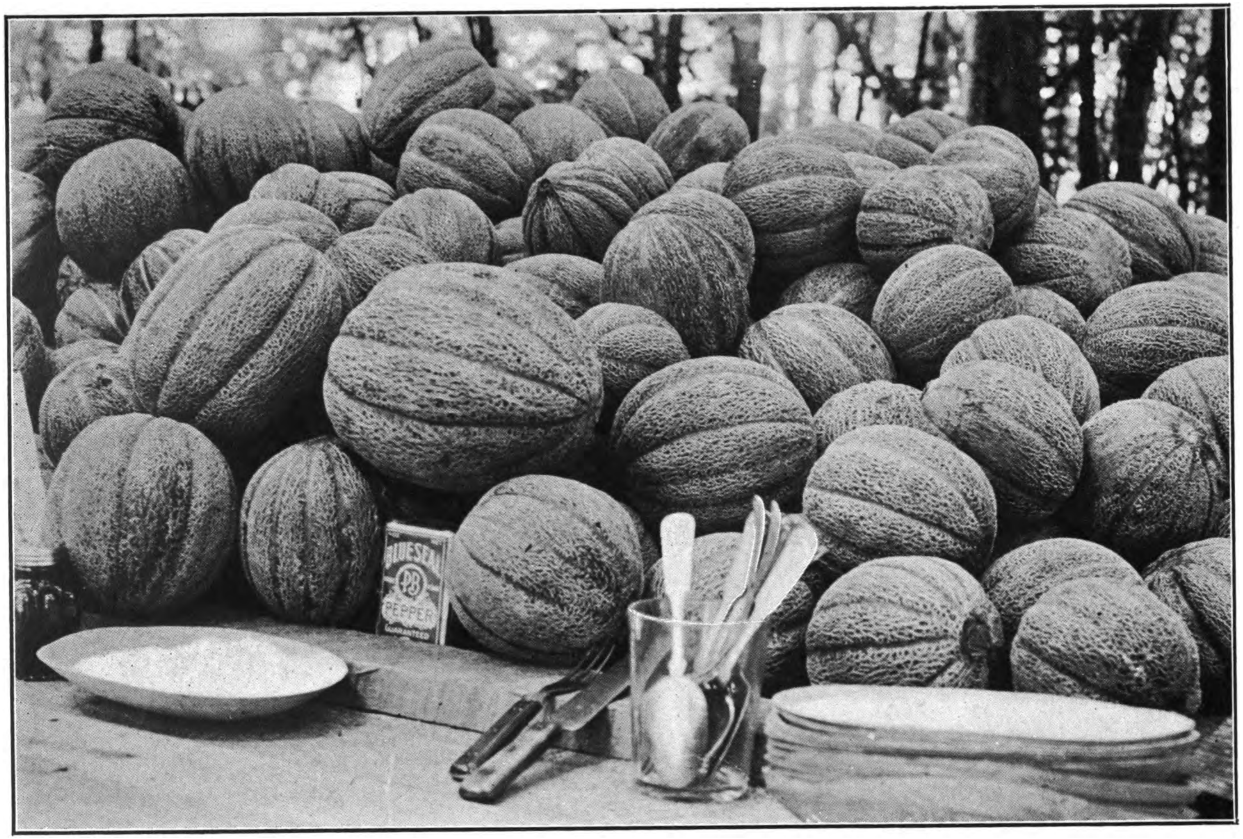
No one doubts Mr. Hale's success as a fruit grower. He says the greatest blessing he has ever received as a horticulturist was the San José scale, because it taught him the use of the L. S. S. wash, which was a great fungicide as well as a perfect insecticide. My Elberta peaches the past season from the sprayed trees were one week later in ripening than any in the Wyoming peach section because of the vigorous growth and heavy foliage caused by the beneficial effect of this wash.

A MEMBER: What is the cost of your spraying outfit?

MR. BROWN: My outfit cost about $38, myself and four sons do the mixing of the wash and apply it. We have but one aim, and that is thoroughness. We cover about 1,000 seven-year-old peach trees daily.

There was an exhibit of almost every style of spraying outfit manufactured in the United States at the late Fruit Growers' Meeting at Geneva, N. Y., and as we are looking for power sprayers, I examined them with considerable care. I find four methods by which to apply power to our sprayers. The gasoline or steam engine, of which the "Fairbanks" seems the most complete, the Traction method of producing air pressure, "The Compressed Air Sprayers," and the "Niagara Gas Sprayer," the two latter doing away with the use of pumps; in the Niagara Gas Sprayer the carbonate of soda is the source of power. This is the cheapest and from experiments has proven eminently successful. It is worthy of trial before investing in the more costly devices.

A MEMBER: How many trees will that one barrel of 60 gallons cover?



Cantaloupes—W. F. Allen. (Photo. by Geo. O. Brown).

Mr. Brown: That depends entirely upon the size of the tree. We used in one orchard of five-year-old peach trees of large growth, 1¾ gallons per tree. Our material cost us less than two cents per gallon. The caustic soda, if used in connection with the L. S. S. wash, will increase the cost of the mixture about one cent per gallon.

I notice most of our scientific men in conducting their experiments are using the lime and sulphur in equal quantities. This, I am satisfied, is a great mistake, and doubtless accounts for the varying successes with this material. My experience is that where used in equal quantities the wash is thin, and will not "set" when applied to the tree as where it is made according to the original formula. I can best illustrate this by calling your attention to the effect produced in the use of a poorly mixed paint in comparison with that which is mixed perfectly. The former will never stay where it is put when applied to the surface where wanted, while the latter always does and makes a lasting and effective covering. By using 40 pounds of lime, 20 pounds of sulphur to 60 gallons of water I get a composition when, properly prepared, that stays just where I put it, does just what I want it to do and just what I put it on for. When this wash is properly made and strained you will have no trouble whatever with the nozzle clogging. I use a Seneca nozzle, which I prefer for this work to the Vermorel. The Gould people have a new nozzle which they claim surpasses anything on the market.

A Member: What do you strain it through?

Mr. Brown: I advise the use of a galvanized iron strainer, running about 30 to the inch in mesh. The L. S. S. will destroy a copper strainer in a very little while.

A Member: Do you get heat enough in your method of cooking?

Mr. Brown: Yes. You cannot begin to generate the intensity of heat by artificial means that you get by the slacking of good lime with boiling water. The difference is about 90 degrees greater with the slacking lime.

A Member: Where did you get the scale from?

Mr. Brown: Our first infestation of the scale came from New Jersey. I received mine from my neighbor. In later years we doubtless got scale from other points, we do not like to hold our neighbor to the east of us accountable for all our ills.

A Member: Will lime, sulphur and salt prevent the leaf curl of the peach?

Mr. Brown: I have never been troubled with leaf curl, but in New York and western Maryland peach districts I am informed by persons who have used it, that it will prevent leaf curl.

President Kerr: I want to express my thanks to Mr. Brown for the encouragement he has given us. The scale has made its appearance in many sections of Maryland.

Mr. Brown: I wish to add one more word and that is, that San José scale has no terrors for me, and orchardists need fear it no more than other insects which prey upon our trees. We need only use the lime, sulphur and salt wash once a year, making the mixture perfectly and applying it thoroughly. This is my positive experience.

President Silvester: I would like to say that with the evidence given by witnesses, is there any reason that any of our orchardists should, in the future, be tormented with the fearful nightmares that have been mentioned by our Chairman.

President Kerr: Mr. Silvester, I hope your dreams may not be troubled with nightmares. As for myself, I have to say that talk is cheaper than killing scale.

REPORT OF THE STATE PATHOLOGIST.

PROF. J. B. S. NORTON.

The usual inspections were made during 1903. All the nurseries that can be located in the State are inspected. The principal inspection being made in the month of August, and another visit made later in the fall or spring, usually in the shipping season. All nurseries have been inspected for fire blight of apple, pear and quince, peach yellows, crown gall and black knot. Fire blight was of uncommon occurrence even on old trees this year. Yellows can rarely be found on nursery stock even if preesnt, as it may often be, where buds are taken from diseased orchards. In some cases it has been present on old trees adjoining nurseries, but was not found so this year. Black knot is occasionally found in nurseries. Crown gall is exceedingly bad in many nurseries. It is much more destructive to peach than apple, but not over one to five per cent of the peach trees are affected in any case that I have observed, but additional evidence of its dangerous character on apple is constantly accumulating. In some blocks of apple over 50 per cent of the trees had to be thrown out on account of crown gall. In some small nurseries, however, the apple stock was entirely free. In these cases the seedlings were grown on the ground. The infection appears to come in on the seedling, in which it is indicated by the abundance of peculiar fibrous roots. Since the gall cannot be eliminated by an ordinary inspection, when it is found, the nurseryman is given a certificate on condition of an agreement to pick out and not use the diseased trees at digging time.

The department has inspected 2,032 orchards for yellows, blight and other diseases. Over 600,000 peach trees were examined in these orchards and 13,033 found to be diseased with yellows or about two per cent.

Most of this work has been made possible by the employment of local inspectors. The following outline shows the plan of the department with regard to local inspectors. It is the intention to have them devote attention to other crops than fruit trees and give horticultural advice to growers of any kind when needed.

LOCAL INSPECTORS.

Historical. In taking up the work of orchard inspecting a few years ago, the officers of the State Horticultural Department found that they could not make much progress without additional assistance. At the time when the inspection could be best made to reach both the scale and yellows (August), the Entomologist and Pathologist and the two or three assistants that they can afford to employ, are needed for their entire time in the nurseries of the State.

Even at other times the work of the Department has assumed such magnitude that the time of the officers is largely taken up with correspondence, preparation of bulletins and circulars, experimenting with control of insects and diseases, giving instruction on the same to those especially requesting it and visiting and investigating special cases of infestation and infection all over the State. And further their time can be more valuably used in this way, than if spent in examining individual trees in orchards for insects and diseases.

So the plan was adopted three years ago of engaging men in the localities where inspection for scale and yellows was most imperatively demanded, to go through the orchards and locate these troubles pointing them out to the orchardists and making out a definite report regarding each case for filing with the Department.

There was some difficulty in selecting men of sufficient intelligence and knowledge of entomology and pathology and with practical experience, who could be employed for a few weeks in late summer, for the limited wages that the Department could pay. But several were secured and the result proved satisfactory, although the *local inspectors*, as they were called, occasionally did poor work, or made mistakes for which the Department had to apologize.

The plan has been continued with some modifications and gradually more inspectors added until we are able, at least in two or three years, to cover about all the sections of the State where horticulture is at all prominent as an industry. However, only about $1,000 per year is available for paying the local inspectors and with this small sum we cannot hope to keep inspectors employed for but a few weeks and only in the sections most demanding help.

The inspectors have usually been engaged after consulting the principal horticulturists of their section of the county, and are intended to be men who would have the confidence of the growers. For above all the duty of the inspector is to help each man he visits towards more success in his horticultural work, and he must first endeavor to remove from the minds of the owners of places inspected, the idea that he is there to execute a law against them, as only in rare cases must this be done.

In addition to the work of inspection we are able to do much effective work through the local inspectors in ameliorating the condition of orchards and gardens in the State. And to this end men are now selected who can give proper advice to the growers regarding the management of orchards and gardens and the cause of and treatment for the diseases and insect depredations with which they may be troubled. And in view of this the Maryland Agricultural College has kindly arranged for the two years past to give two weeks instruction in Horticulture, Entomology and Plant Pathology to such inspectors as can spend that time at the College, and it is the purpose of the Department to give the preference to men so equipped for the work.

Another important work is giving aid to those who wish to spray or otherwise treat their crops. It is important that as many as possible be induced and helped to treat their trees when infested with scale, and the same is true for several other dangerous troubles. So the Department has endeavored to secure men in the local work who can spend most time spraying for the growers or helping start their spraying operations. To assist in the spraying work, when possible, spray pumps, owned by the Department, have been placed in the hands of the local inspectors.

Equipment. The equipment furnished by the Department consists of the above-mentioned pump and accessories, which must be kept in repair by those using them; a hand magnifying glass for examining small insects, fungi, etc., and suitable blanks for making out reports and bills. A supply of bulletins and circulars and other publications needed for distribution can be furnished.

Instructions Given to Inspectors. The following points for the guidance of the inspectors may now be given, and for anything not included herein, the officers of the State Horticultural Department must be consulted before action is taken.

1. The inspectors should take care to avoid trouble if possible, with the owners of places visited and to use persuasion rather than force, and secure permission, if possible, to inspect the grounds, and only as a last resort to use the police authority given by the law to enter a place.

2. Absolute impartiality must be shown. This is imperative, as more serious complaints arise from mistakes in this line, than from anything else. The inspector has an opportunity to exercise a considerable influence in the community and such influence would be impaired if he should be engaged in any agency or other business which would cause his impartial attitude to be mistaken, although his actions might be perfectly honorable.

3. If in doubt whether to condemn trees or not, give the owner the benefit of the doubt and advise him to watch for future developments of characteristic symptom.

4. Certificates will be given each year to the inspectors appointed. These will show their authority in their official capacity and should be returned to the Department when the inspector has finished his work for the year.

5. The general plan is to have a large part of the inspection done about the time of the ripening of peaches, since this is the best time to distinguish the first stages of yellows. The inspectors should endeavor to cover the points in their territory, which will be defined each year, visiting such places as seem to need inspecting, or where large horticultural interests are present and places where he is requested to go, endeavoring as much as possible to cover territory not previously inspected. The inspectors should meet the owners or tenants in as many cases as possible, have them go with them through the orchard and point out to them the diseased or infested trees. These trees should be marked in such a way that the owner or future inspectors can recognize them.

6. The amount of territory covered per day will depend upon the character and size of the orchards and their distance apart. In large orchards our inspectors have averaged 5,000 to 6,000 trees per day. It is necessary to see each tree in an orchard. Walking between the rows and looking at those on each side and frequently examining them carefully is usually sufficient.

7. Nurseries are not to be inspected, as this work is done by the officers of the Department.

8. The following *diseases* are to be noticed especially: Peach yellows, fire blight of pear, apple and quince; black knot of plum and cherry; bitter rot of apple; blight, rot or wilt of cabbage, tomatoes, potatoes, melons, etc., and where possible crown gall and other root diseases of trees. Those which are condemned and reported on the blanks and which must be examined for especially are yellows and fire blight. The others should be noted generally, together with all other kinds of serious diseases on a separate blank which will be supplied.

The *insects* to be inspected for are San José scale especially, and others designated by the Entomologist.

9. *Reports.* Bills against the State Horticultural Department, Maryland Agricultural College, should be sent in each week, giving the date and the amount of work for each day. Reports of inspections made must be furnished each week on the blanks given out by the Department. Particular care should be taken to get the names of growers and their post offices correct, making sure, if possible, of the spelling of the same. Where the place is in the hands of a tenant, the tenant's name and the location of the orchard should be given, where it is different from the post office of the owner or tenant. It is important that all failures to remove or treat the trees marked in previous years should be reported, as sometimes this is the only way we can determine whether the requirements of the law have been fulfilled. Intentions or attitude of growers toward treatment should be reported.

10. Specimens of all peculiar diseases or insects with which the inspectors are not familiar should be sent to the Department for identification.

11. Throughout the year the Department should be kept informed regarding the conditions of crops and any unusual developments in which the officers are interested. Blanks will be furnished for monthly reports.

12. Advice to growers. Inspectors should advise growers to make frequent inspections themselves, since it is impossible for the Department to inspect every place more than once in one or two years. Whenever in the orchard the grower should look over it for diseases or insects and they should be carefully examined at least twice a year. The inspectors can give them instructions about these personal inspections.

13. The growers should be encouraged to maintain their own spraying outfits. The inspectors will have abundant work in the line of spraying for those who can not do it themselves. The in-

spectors can give advice as to where pumps can be secured or how they can be obtained as well as about the purchase of chemicals for spraying. There will also be splendid opportunity to give advice on horticultural methods even more important than the control of diseases and insects.

14. Official notices have been sent out to all those reported to have trees with yellows, blight or scale, in addition to the notifications given at the time of inspection. The inspectors are requested to endeavor to secure answers from the growers to the notices requesting information as to the disposal of their diseased or infested trees. Those who receive the notice should not in any way feel aggrieved, if they have fulfilled the law, but remember it helps the work a great deal to receive the replies.

15. The inspectors are also requested to secure the names of those to whom bulletins could be sent from the Experiment Station or State Horticultural Department, and where they would be appreciated, and also may be able to secure desirable members for the State Horticultural Society.

16. Powers. The local inspectors are not endowed with any power to destroy any property whatever, unless by special notice from the Department in each case. The powers to enter premises for inspections are indicated by the following paragraph from the State Horticultural Law.

"Sec. 55. That in order to accomplish the purpose of this Act, the State Entomologist and the State Pathologist, their assistants and employes, or any other officer, assistant or employee appointed by said board of trustees, are hereby authorized to enter upon any public premises, parks, cemeteries, or other premises or upon any land of any firm, corporation or private individual, within the State of Maryland for the purpose of inspection, destroying, treating or experimenting upon the insects and diseases aforesaid."

17. Financial Considerations. At present the inspectors can be only kept in the field for some two to six weeks during the latter part of the summer. In addition to this, however, inspectors may be called upon to spend a few days at odd times looking up other cases, making reinspections or removing or treating trees where it is necessary for the Department to do so. Occasionally the inspectors may be employed by the Department in looking up shipments of improper nursery stock or sometimes for several weeks during the shipping season in assisting with the nursery work. In addition to this it is possible for the inspectors to do a great deal of work in spraying, pruning and other improved horticultural operations and for which

they can arrange with the grower, who also will pay them; such work usually bringing two dollars per day. The inspectors by doing good and faithful work for the good of the community can secure an influence, as their experience accumulates, which will be valuable to them in many ways, as they come in touch with most of the people of their section.

The usual visits have been made to all parts of the State, and addresses have been made before farmers' institutes, farmers' meetings, etc. Another important form of instruction work is the exhibits of plant diseases and methods of controlling them prepared for the Maryland Experiment Station and shown at the county fairs. Pumps were kindly furnished for this by Griffith & Turner for showing the methods of spraying fungicides. Samples of our work and collections of Maryland plant diseases have also been sent to the St. Louis Exposition.

A great many inquiries regarding plant diseases and their treatment have been received at this office and from the College and Experiment Station and have been answered. Much has been done toward a thorough knowledge of plant diseases in this State by our correspondents who sent specimens for examination, and it is hoped that many others will do so.

The following circular bulletins have been issued since my last report:

43. "Peach yellows." J. B. S. Norton, October, 1902.

50. "Bordeaux Mixture and its Use." F. H. Blodgett, March, 1903.

51. "Apple Diseases and their Treatment." J. B. S. Norton, March, 1903.

52. "Insects and Diseases of the Tomato." T. B. Symons and J. B. S. Norton, April, 1903.

53. "Digest of State Laws, relating to the control of insects and plant diseases." J. B. S. Norton and F. H. Blodgett, May, 1903.

Investigations in Plant Pathology during the year have been as follows: (1) A study of the distribution and abundance of all the principal plant diseases in the State and their effect on crops. (2) Investigation of crown gall on apple. (3) Cabbage plant mildew. (4) Peach rot (Sclerotinia stage). (5) Co-operative tests of spraying methods for apples, tomatoes, and melon diseases. (6) Varieties resistant to diseases.

The kind co-operation of many horticulturists, orchardists, nurserymen and gardeners in our inspection work, in answering inquiries and in aiding in experiments has facilitated the work much. Grateful acknowledgment is here expressed for all this, and sincere thanks to those in charge of the institutions with which our Department is associated, for many facilities provided and much encouragement given.

Addresses and Papers.

PRESIDENT'S ANNUAL ADDRESS.

J. W. KERR.

The epigrammatic Elbert Hubbard says, "No book is of much importance; the vital thing is, What do you yourself think?" If to our *horticultural* books so little of value attaches, it is all the more vital to us, encompassed by multiplying difficulties, varying in degree and character, fastening their parasitic grip upon the arteries that encourage expansion and promote stable growth in our chosen industry, to seriously, vigorously, and aggressively think for ourselves. In grave and comprehensive earnestness apply ourselves to a candid solution of a few plain questions, viz:

First—As a society, "where are we at?"

Second—What progress are we making?

Third—How many points would we be entitled to on a national score-card?

This is the sixth annual convention of the organized horticulturists of a State that nature has pre-eminently destined a leader in this field of refined industry; the wisdom of the liberal-minded practical men, as well as the very best of horticultural scientific attainment has been brought here, and annually laid upon the shrine of this State organization. Is this to constitute the measure of this society's usefulness? A membership aggregating about three thousand people, who rank with the best citizenship of the State. Has such a society no loftier aspirations than the friendly indulgence of hortatory declamation? Too true, indeed, is it that there are few of us who could not profit by good advice, if we possessed the energy and courage to act upon it. Necessity sometimes drives us to it, while ambition less frequently succeeds in leading us to its practice.

Would an inventory of results achieved in the advancement of practical horticulture by this society, if made to-day, exhibit performances commensurate with its opportunities? Does there not a potential significance gleam appealingly from the rapidly increasing volume of membership? There can be but one honest interpretation of the facts as circumstances and conditions have lined them up to confront us. What shall we bequeath to those who are to follow us—simply a record of our timid indifference? Three thousand Marylanders enlisted and organized in the interests and development of horticulture. Think of it! If the gallant Gist would have had a brigade like this instead of a mere battalion on that eventful August day in 1776 on Long Island, the entire history of a great nation doubtless would be different. Three thousand twentieth century Marylanders, firmly united and peacefully guided by the ennobling inspiration of their God-favored calling, should, indeed, be a mighty power and prompt, not only in redressing wrongs, but in elevating the rights of horticulture in all its varied spheres of activity throughout the State.

Finely interwoven in every syllable of Nature's law is the inflexible decree that the highway to success in horticulture shall all be "up grade;" and the only permissible motor is the electrical current of vigorous thought. Corroboration and advertisement of this fact accompanies every attempt and effort in cultural production. Organization, effective and aggressive, with intelligent direction, serves as a friendly auxiliary in checking and overcoming these difficulties. With such direction, this society is capable of not only establishing reforms—desirable and profitable in the multiplicity of details affecting cultivation in its broadest application—but the more important possibilities in such unity are associated with the influences and rating with organizations and corporations that derive commercial benefits directly and indirectly from our calling, and which, in obedience to the modern creed of trade, will appropriate to their own use all we have if we do not protest. Is there an industry or individual interest in our State that would not in some relation derive benefit from invigorating and broadening the methods and supplying effective protection to the interests of horticulture? Any reasonable measures for such purpose could not fail to receive endorsement by every business man and institution of our commonwealth. Change the horticultural kaleidoscope as often as you please—vary the forms and colors to satisfy your every fancy—but the foregoing facts still stand out like finger boards, and all point the same way. No catalogue of results to be achieved or duties to be performed by this organization is needed as a guide for its conduct; these are emblazoned upon nearly every orchard, vegetable field, and garden in the State, as well as upon the products thereof in package, in transit, and in market. As individuals, we are frequently saddened by their defiant attitude on the checks received for "net proceeds."

If there existed within reach a paying market for fruit and vegetable diseases, together with insects destructive to plant life, many of us doubtless would feel encouraged. From all the data at my command the conclusion forces itself upon me that the crop of disappointments for 1903 was larger than usual throughout horticultural Maryland. Atmospheric conditions during nearly the entire year were more or less distorted. Scarcely any of the "made to order" kind appeared on parade.

It is rather a difficult matter to make any reference to orchard pests or troubles of any kind to fruit growers east of the Mississippi, at this day, without arousing their fears of *the* scale. Nightmares on nightmares, phalanx deep, if all harnessed to modern constructed lime-spreaders, broadcasting their fiendish germs to prey upon the peaceful slumbers of mankind, could scarce keep pace with this pest in its diffusion of anxiety in the minds of tree planters. If I were going to say anything about the scale, I should insist upon addressing a full class of the very best entomologists in America; and with feelings of the most serious solicitude would ask, What of the future, oh, watchmen? What of this dreadful horticultural night—this devastating tree leprosy—this fish-armored imp from the opium and ginseng markets of the Orient—this atom of vitalized sulphur, whose powers of multiplication belittle and make a laughing stock of electrified geometrical progression? Oh, watchmen, what of the future? Can you not find a Jones to pay the freight?

I trust you will pardon me for apparent presumption, but before concluding I desire to briefly present a thought in keeping with what should be the work of this Society.

Summarized, the urgent needs of horticulture in Maryland present themselves to me somewhat as follows:

First—Preparing our products for market by methods based on modern business principles.

Second—Co-operation, neighborhood, county, or district, as circumstances make most practical, in the sale or final disposition of such products.

Third—Careful revision and amendment of our State laws relating to horticultural interests.

Reforms such as are embodied in these three propositions, if applied and administered with judicious business sense, can in no way prove inimical to the interests of other industries, while they would greatly enliven those of horticulturists and afford them much needed protection.

To you, gentlemen, of the Maryland State Horticultural Society, the foregoing is submitted, with sincere thanks for your courteous attention and patience.

THE GROWTH OF TRUCKING IN THE SOUTH, AND ITS LESSON TO MARYLAND.

PROF. W. F. MASSEY.

In all the lines of soil culture there has been no greater development than in the production of the fresh vegetable supplies for our large cities. We can well remember when it was the general opinion that the cultivation of vegetables for the city markets must always be confined to the immediate vicinity of the cities supplied, because of the necessity for getting large supplies of stable manure, without which the gardeners deemed it impossible to produce profitable crops. Then when the introduction of Peruvian guano started a few Jerseymen to growing stuff for the New York market to be shipped in, the nearby gardeners said that this might do for such stuff as peas and beans, but that bulky articles like cabbages could never be grown and shipped in profitably by rail. But with the increased use of commercial fertilizers the production gradually extended southward as the railroad transportation afforded a means for getting the stuff to market.

In our first efforts at growing truck for the Baltimore market we were handicapped by the fact that there were then no purely produce commission merchants, and the grain commission men had no facilities for handling this stuff, and thought it beneath their dignity to have anything to do with it. Between thirty and forty years ago I began to grow winter lettuce in cold frames on the Eastern Shore for the Baltimore market. It was a rather risky experiment, for I devoted 600 sashes to the work and grew fine lettuce. An old friend who had failed to make a living on his farm determined to go to Baltimore and enter the grain commission business. He begged me to send him some of my lettuce, saying that he knew that he could sell it. So about the middle of January I cut my first shipment and sent it to him. A few days after I had returns from him saying that the market was full of lettuce and that he could only get one and a half cents for it. I was satisfied that the old man had let the hucksters fool him, but said nothing, and pocketed the loss, for the shipment hardly paid freight. A few days after this a friend who had been on a visit to Baltimore said to me, "I ate some of your lettuce at my cousin's in Baltimore." I asked him how he knew this, and he said that the man who sold her the lettuce told her that it came from her old home, Chestertown. He said that she bought some for a treat for it cost twenty cents a head. This showed me that I was right in my supposition. I wrote to a firm then just starting a produce commission business and asked what good head lettuce would bring, and whether there was a demand for it. They replied that there was no lettuce in the market, but Boston hot-house lettuce and that if I had good head lettuce it would sell well. I shipped them the next day a lot of the same size I had sent to my old friend a few days before, which had netted me $1.50, and they sent me a check that made this lot clear me $15.00, and they sold my whole crop for from 5 to 15 cents a head.

In the spring of 1870 I caught an unusually favorable spell of weather and planted at Chestertown a crop of early Irish potatoes the last of February. Fearing that cold might injure them I covered part of the patch with straw thickly after planting. This part made an unusually fine crop, and was less affected by dry weather than the remainder which was not covered. In digging them there were many small potatoes left mixed in the straw, and as I got busy with other matters this piece of ground had no other crop put on it. Late in summer I found that potatoes were coming up all over the bed, and I let them alone, simply pulling the weeds from among the rotten straw. In November I dug a finer crop than the early one. At that time the truckers about Norfolk were just getting on their feet after the war, and I wrote to a friend in the business there that it would be a good idea for them to grow this second crop there, as they could do so uniformly. From this was started the practice of growing the second crop of Irish potatoes in the South, and Maryland started it.

In my early efforts at trucking on the Eastern Shore I was handicapped by the fact that at that time I was about the only one attempting it there, and one man in such a business has a poor chance at the transportation companies. I found that though right across the Bay from Anne Arundel I could beat the Anne Arundel truckers in market with tomatoes by two weeks, and found that the soil in Kent was peculiarly adapted to tomatoes. During this time the railroads were being pushed down the Peninsula and connections being made South. With quick water and railroad transportation and reasonable freights to the Northern cities, the Norfolk truckers were developing the business to a wonderful extent. Seeking an earlier climate I made a contract with the owner of the Hygeia Hotel at Old Point Comfort to go there and raise supplies for the hotel and sell the surplus North. A very fine piece of land was selected adjoining the Soldiers' Home near Hampton, and we built large greenhouses and put down 1,000 sashes in frames for lettuce and cauliflower. At that time the sashes cost $2.500 in New York. I built frames for 2,000 sashes so as to use my sashes economically. In 1,000 sashes were set 6,000 cauliflower plants and then filled in with Boston market lettuce. The lettuce was cut out and sold by the first of February, and by that time the cauliflowers were pushing their leaves against the glass, which was then gradually removed and placed over the other frames in which I spotted out my tomato plants grown in the greenhouse. Besides the use of the sashes for this purpose I sold of the lettuce and cauliflower crops $3,750.00.

At this time the sudden death of my partner, Mr. Phoebus, and the unwillingness of his heirs to continue the contract caused me to abandon the work there, and to take up the work of horticultural teaching which was offered me by the Trustees of the Miller School of Albemarle. A few years later on the organization of the N. C. College of Agriculture and Mechanic Arts, I was offered the chair of Horticulture and Botany and the position of Horticulturist of the Experiment Station, which position I have held for the past fourteen years or more. This has given me an opportunity to observe the development of the trucking interest in the South, and to have some hand in forwarding it.

In the beginning of the culture at Norfolk the growers there came to the conclusion that they were as far south as it would ever be profitable to grow garden truck, notwithstanding the fact that some of the growers at Savannah had begun to make it profitable to ship watermelons North by steamer. But as the railroads went further South, and disconnected lines became consolidated into great systems the splendid truck lands of Eastern North Carolina began to come into competition with Norfolk.

The first development was about the city of New Bern, where the growers had the advantage of water communication to keep down railroad freights, and their climate put them several weeks ahead of Norfolk. New Bern is still the headquarters of the trucking industry in North Carolina, though all along the Coast Line Railroad much is being done in the same line, and special cultures are being centred in the most favorable locations. The strawberry industry has never been large at New Bern, but about the town of Mount Olive on the Coast Line the soil seems peculiarly adapted to this fruit, and fortunes have been made in the strawberry there. The soil in this locality is a dark fertile loam underlaid with a stiff clay, and the water table is but a few feet down, so that the land seldom suffers from drought. Further South on the same railroad the strawberry has never been very profitable, as the soil is too sandy. The earliest strawberries from North Carolina come from Chadbourn in Columbus County on the old Coast Line track between Wilmington and Florence, South Carolina, where the soil is similar to that at Mt. Olive. The great horticultural development in the region south of Mt. Olive has been about Magnolia, where the growers are not interested in what is generally called trucking, but are bulb growers. The business started with the tuberose. It was found that the black sandy soil there was peculiarly fitted to the production of tuberoses, and the business has finally centred there, and hundreds of acres are now grown, supplying the demands of the Northern and English markets. Naturally from growing tuberoses they have been led to experiment with other similar products. The tuberose crop of the section is handled almost entire by two firms who have large curing houses and handle the crops of the smaller growers. These firms have branched out into the culture of other bulbs. But of this later.

About ten years ago a grower in the eastern part of the State wrote to me asking if I did not think that the winter crop of lettuce could be grown profitable there. I told him that there was no doubt of it if well grown. I advised him to use glass sashes and cold frames with straw mats for severe weather. He did put down some glass-covered frames but the cost of glass alarmed him and he made the greater part of his frames for cotton cloth covers, arranging them to roll up like an awning. In ordinary winters these cloth-covered frames do fairly well. But this grower assured me that he could get a third more and better lettuce from his glass, though he still stuck to the cloth. I find it hard to convince them that in the long run the glass is the cheaper. Other growers began to follow suit and soon there were hundreds of acres all over eastern North Carolina covered with cloth for winter lettuce. Then came the hard winters of '93 and '94 and a great deal of damage was done to the lettuce under cloth. In the glass covered frames a snow fall is simply a protection from the cold that follows the clearing weather, but on the cloth the snow pulls it down on the lettuce and it has to be removed and the crop is then exposed to the worst cold of the winter.

Recently the large lettuce growers have adopted another plan. I visited one of these firms at New Bern in October. They now have five acres in frames, each eleven feet wide and covered with cloth. They have a steam boiler of 160 horse-power, and through each frame have a one-inch steam pipe just enough to keep out frost, and not make too great a heat. On these pipes they have sprinklers and can detach the pipes from the boiler and attach to a steam pump and can thus water the frames all over in a little while. They told me that last winter they had two and five-eighths acres, and the plant cost $5,000, and they sold $8,000 worth of lettuce. Having plenty of steam they are this fall extending to five acres and in some of the frames set celery thickly in late October, expecting to have the crop ready for the spring market after the northern crop is over. With their splendid soil and heavy manuring they will doubtless succeed. I suggested to them that I thought that glass sashes without the steam would be greatly more economical. But the first cost of the glass is always a stumbling block. In my own frames at Raleigh, I have no difficulty in getting two crops of lettuce during the winter, while the eastern growers depend on one crop, and then fill their frames with beets for the early market. While I believe that the North Carolina growers will soon find that real forcing with glass is what they should attempt, and that with glass and no steam they can grow the lettuce crop fully as well as it is grown in the northern greenhouses.

That intensive work under glass is certain to come in the upper South there is no doubt. In no other way can our growers meet the competition from the far South. Eastern North Carolina is peculiarly well situated for winter forcing. Our abounding sunshine during the winter counts for more than all the fire heat that can be used in the dark weather common in the North, and the quick transportation now to be had will make the business profitable. Not half the coal is needed to run a greenhouse there that is needed in the North, since the mercury rarely drops lower than 20 above zero, and it is rare that two cloudy days come in succession. Just as the competition of the upper South compelled the Northern growers to go to winter forcing, so the competition of the lower South will force the upper South into the same line. Another thing that is causing the growers to tend toward more intensive work is the increasing scarcity of laborers. The firm at New Bern whose steam plant I mentioned have heretofore been growing about 500 acres in truck annually. They told me that next season they would not plant more than 150 acres on account of the scarcity of hands. The negroes are flocking to the northern cities and to the coal mines and farmers are being cramped for labor. This will compel smaller areas and more intensive work.

Some years ago our truck growers were attacked with the pea louse at the same time it made its appearance here. I was sent for hurriedly to go to New Bern to advise them what to do. I went, and was taken to a field of 125 acres in peas, and it seemed that every plant had a million of the Aphides on it. They asked me what was to be done. I told them that anything they could then do would cost more than the crop was worth, and that all they could do was to prepare for the next year. I told them that in all my experience as a gardener both outdoors and under glass, I had found that tobacco was the sovereign specific against every form of Aphis, and that if in preparing their fertilizer for peas the next year they would use tobacco stems liberally in the furrow, and then as soon as the plants were fairly up would dust them over with tobacco dust that they could get cheaply from the smoking tobacco factories, I did not believe they would have much trouble from the lice. They followed these directions and wrote me the next spring that a few lice put in an appearance and soon gave up the ghost, and from that time there has been no trouble there from lice on peas, while the papers have been telling us of the bother they were causing in Anne Arundel and elsewhere in Maryland. Prevention is the only thing that will be effective in any fight against insects. If you put off fighting the pea louse till he is here, you will never get rid of them till they vacate of their own accord.

What lessons can Maryland growers learn from the experience of the South? One thing is that in the sharp competition of to-day it will not do for any section to depend merely on the advantage which its climate gives it over sections north, but that each section must try by intensive methods to compete with those further south, and by reason of superior products and a shorter freighting to make a greater profit. The North Carolina lettuce growers are competing both with the greenhouses of the North and the Florida lettuce of the South. Where they use a simple frame and glass sash they can grow as good lettuce as can be grown in the northern greenhouses. And the same is true in Maryland, with the exception that here the frames must be sunk somewhat and well protected with mats in cold weather. I have produced as fine lettuce in frames in Kent and in Baltimore Counties as was ever grown in a Boston greenhouse, and far better than can be grown in a greenhouse here, for no matter how careful the grower, a greenhouse in this latitude will almost invariably get too warm for lettuce, while in frames it is easy to strip the glass down in mild weather. The Eastern Shore peninsula, with a climate mild for the latitude, and with the quickest transportation to the cities that are clustering all around its upper end, should become a great forcing garden for the north. In lettuce alone the growers of Eastern North Carolina will sell close to half a million dollars worth this winter and spring.

Even if the frames here did not mature a midwinter crop well, you can winter the plants and head them with the increasing sunshine of the spring, and while the midwinter crop pays, the spring crop always pays better. Every one wants green stuff in the spring, while during the winter only the rich and fastidious are looking for it. When I was growing lettuce at Chestertown, I shipped Boston market lettuce in February at a fair price. I had in one frame a lot of Black-seeded butter lettuce which did not head till the first of April, but then made very fine heads. I thought it was hardly worth while to send it to Baltimore that late, but I determined to try it. This lettuce sold for 15 cents a head or three times the average of the winter crop of Boston market. In the development of the winter lettuce industry in North Carolina there has, of course, been a good deal of interest in varieties. Most of the growers have settled on the Big Boston as the best for their purposes, and it is grown almost to the exclusion of all other sorts. Recently I tried the Wonderful, a variety produced at Raleigh similar to the Hanson. It was not recommended for growing under glass, but I found it a very fine lettuce in the late spring. The present fall, being short of plants owing to the dry weather, I have planted a frame in the Wonderful, and the way it has grown has convinced me that it is far superior for frames to the Big Boston. It is hardier, seldom troubled with the stem rot that takes off the Big Boston at times very badly, and has beaten the Boston in rapidity of growth and was ready for market before the Boston turned a head. It reminds me much of what the Baltimore truckers used to call the Lazy lettuce.

Of one thing I have become satisfied from my experience and observation in the South. This is that so far as the crops from the open ground are concerned there is just as much prospect for profit in Maryland as there was before the competition of the South began. The strawberry crop from North Carolina does not interfere with that from Norfolk, for when the Norfolk crop comes in, their cheaper freight rates compel the North Carolina growers to stop, and the same things take place when the crop from the Peninsula comes in and the Norfolk growers drop out. In fact each section has its own chance at the market.

There is one vegetable crop in which the South can never compete with Maryland. This is the tomato crop. Of course Florida can get a fancy price for winter tomatoes, for if she did not get a fancy price she could not grow them, as the crop there is greatly inferior to yours. And the same thing is true all over the South except in the mountain country. When I first moved to North Carolina and found in the month of September that tomatoes were selling by the dozen in Raleigh, and that in a city of 20,000 people I could hardly find a bushel of tomatoes it seemed wonderfully strange. But when I began to grow tomatoes there I soon found that it was not the easy job that it had always been to me, and now, after fourteen years' experience there, I find that I must plant from 300 to 500 plants to supply my table with enough for slicing during the summer, and we never get a surplus either. The great drawback is the Southern blight that sweeps off in a night plant after plant loaded with fruit. I once set 300 plants in my garden and did not get a dozen tomatoes from them. The blight got them all. Then early tomato plants that have been forwarded under glass, while they will give us some early fruits, almost invariably succumb to the heat and drought of the last of June, and if we do not have a later sown lot to keep up the succession we will soon be without tomatoes. The only way I have succeeded is to make three sowings so as to have plenty of plants to go through the season. Eastern Shore growers raise tomatoes for the canners, $6 to $8 per ton. In the dry hills about Raleigh I would not to-day take a contract to grow tomatoes for $50 a ton, for I do not believe I could make expenses at it.

All over the Eastern Shore and elsewhere in Maryland you can grow the finest of late cabbages. In North Carolina they grow exceedingly well in the high Alleghany plateau 2,500 to 4,000 feet above the sea, and they are grown there in immense quantities for the Florida and South Carolina markets in the fall. But in Raleigh all late cabbages are brought from a distance, and no one tries to grow anything but the loose headed collard. With irrigation and heavy manuring we might get them by the middle of December, but not in the earlier fall. Years ago from Kent County I put tomatoes on the market the last week in June in quantity, and picked and sold from the same plants till frost. Such a thing would be impossible in the South. While there are many things in which the South excels, and certainly our growers make money in their business, I am perfectly sincere in saying that for successful market gardening I could pick out locations on the Eastern Shore of Maryland where with the experience that has come with gray hairs I could make more money at truck farming than anywhere in the South, Florida not excepted.

In speaking of the second crop of Irish potatoes, now grown so largely in the South, I should have mentioned the fact that few, if any, of the Southern gardeners now ever think of planting Northern seed in the spring, except by way of experiment with new varieties. They have found that the second crop seed are far better, more productive and more hardy. A frost in spring that will cut the tops of the Northern grown potatoes to the ground will merely scorch the home-grown plants. Why this difference in hardiness, I do not know, but that it is a fact I do know. Some years ago I began some co-operative experiments with the Cornell and Maine Stations. They agreed to send me some of their early seed potatoes, which I was to plant and from them grow a second fall crop. The following season I was to send them some of these to plant there, and they were to send again some of theirs to plant here for comparison, of the same stock as the first ones sent me.

I grew the crops as agreed upon, and the following season planted mine and theirs alongside each other. The difference in the growth of the two was so remarkable that I took photos of two adjoining rows, and at digging time I placed the crop of fifteen hills of each side by side and photographed them. There was not a potato in the crop from the Northern seed that would not have been a culling in the crop from the home-grown seed. The difference in growth was very marked during the season. The Northern seed had evidently been sprouted and had the sprouts rubbed off in winter, and when they grew they produced a bunch of weaker shoots than if they had not been sprouted. The home-grown seed, dug in December and planted again in February, were out of the ground but a comparatively short time, and had not started a sprout, so that when they grew it was with the strong growth of the terminal bud, and the plants made stout single stalks instead of the weak bunch of stems from the Northern seed. My northern friends dropped the experiment right there and failed to send me more potatoes the next spring. The home-grown potatoes do not start so quickly as the Northern ones, and with us this is an advantage, as they are not so apt to be caught by a late freeze. But when they do start, they make up for all lost time in their robust rapidity of growth, and the man in the South who would plant Northern seed would be considered behind the procession to-day. Whether the Southern seed would have the same character here or not I cannot say, but it is well worth the attention of growers northward.

In producing the second crop I throw the potatoes as dug into small winrows and cover them at once with soil, after having cut off a small piece of each, for they sprout more readily for being cut. The land is prepared for them in August, and as the potatoes are found to be sprouting they are planted, and none planted but those that have sprouted. In this way we are sure of a good stand. This year, being absent in August my crop was neglected, and on my return the potatoes were showing green leaves above ground. But I took them up and planted them the first of September and made a fair crop.

That the evolution of the trucking industry is certain to go forward in the South I have already intimated, and that it will take on a more intensive character. Americans, as a people, are apt to want to engage in extensive transactions in any line of business, and the Southern people are no exceptions. They have wanted to be big truckers. Now, with the growing scarcity of laborers and the great profits that have been shown from intensive work, they will be certain to develop along the line of winter gardening under glass. With the great increase in population and the convenient and rapid transportation, the same evolution will take place on the Eastern Shore till that garden spot of the upper South becomes one vast garden from Cecil to Cape Charles, and Florida's winter competition will not be felt. I have sold forced tomatoes in Raleigh in direct competition with the Florida product and got three times the price from the dealers that they were retailing the Florida tomatoes for, all because of the superior quality of the forced tomatoes. And Marylanders do not need to go further South to do the same.

This paper would not be complete without some more complete reference to the culture of flowering bulbs for florists' use. Thirty years ago all the tuberose bulbs used in this country were brought from Italy, and florists considered it essential to have Italian bulbs for success. The late Isaac Buchanan of Long Island, I believe, was the first one to intimate that we could grow them successfully here. In 1870 I began to grow tuberoses in Kent County, Maryland, and the result was bulbs of wonderfully larger size and quality as compared with the Italian. Some of my bulbs sent to London sold for $60 a thousand, a price that has never been equalled since. My last commercial crop was grown at Chestnut Hill, Waverly, in Baltimore County, for the late firm of B. K. Bliss & Sons for $10 per thousand. I then suggested that the soil and climate of eastern North Carolina ought to be specially suited to the crop. The hint was at once acted upon by H. C. Newbury, of Magnolia, N. C., who is still the leading grower of the crop there. After making experiments in South Africa the London dealers became convinced that no country could compete with the North Carolina product, and the culture of the tuberose has centered in the limited section about Magnolia, N. C., where the growers now supply the entire demand for these bulbs.

Owing to the general use of the tuberose flowers at funerals the public became accustomed to connect the odor with funerals, and they became unpopular for general use, so that the demand has been less of recent years and the price has accordingly fallen till the growers do not get but about $4.50 per thousand for the best bulbs, a price that is not as remunerative as it should be, and some efforts have been made to make a combination to advance the price. Such a combine would be of advantage to the growers and the Northern dealers, too, for the competition now injures the dealers as some, having large contracts with growers at a fixed price, are apt to be undersold by others who pick up outside lots at starvation prices. The larger part of the tuberose industry has, however, settled in the hands of two firms who have the large curing barns that are needed for the perfect curing of the bulbs, while the imperfectly handled crops of the outsiders sell for low prices owing to imperfect curing. The annual area in tuberoses in North Carolina to-day is about 300 acres, and this means that millions of the bulbs are yet sold.

The low price that has prevailed of late years for tuberoses has led the growers to experiment with other bulbs and roots. There are now cultivated in the Magnolia section about 75 acres in Caladium esculentum, 50 acres in cannas, ten to fifteen acres in dahlias, ten in gladiolus and smaller areas in crinums, Amaryllis Johnsonii and other bulbs. The growing of narcissus has as yet been small in the tuberose section, but is increasing. The narcissus is largely produced, however, in southeast Virginia and very successfully.

As is well known to the florists, I have been engaged for years in experimenting with the Bermuda lily. For some years I was greatly bothered with the Bermuda disease, but have gradually eliminated it. I found that our soil about the city of Raleigh was too subject to drought for the best success with these bulbs, and last year I removed most of my bulbs to the number of about 25,000 to the level and moist soil of the eastern section. They are doing better there and with improved knowledge of their needs, I believe, that the time is not far distant when we will produce these bulbs on a commercial scale as perfectly as in Bermuda. We are not yet out of the experimental stage with them, however, but are learning. In common with gardeners everywhere I was of the opinion that lilies do not like animal manures, and it is true that they do not want fresh and fermenting manure. But heavy manuring does agree well with them. Last year I planted the lily bulbs I had reserved in heavily-manured soil at Raleigh. The bulbs were the best I ever grew. This fall I have planted them in land heavily manured with a compost of sods and hen-house manure that was turned and fined all summer. After planting, I mulched the entire plot with fine rotten cow manure, clear of all rubbish, and am looking for the finest bulbs I have ever had and a solution of the true plan for their production.

In the moist, sandy soil of the tuberose section a few years ago one grower produced a remarkable crop of Roman hyacinths. They were larger than any imported French ones. I visited him when he was trying to cure them and told him that he had failed for it was evident that the bulbs were going to gum. They did gum, and he was so discouraged that he never grew any more, though it was only his inexperience that spoiled them. Planted at the proper time and cured in a proper manner the growers of eastern North Carolina can produce Romans of better quality than the imported ones. Planted too early there they get in bloom before Christmas and are then exposed to the coldest weather of winter on their tops. But planted about Christmas, after the ground is cold they come in when the weather is more favorable. The soil in eastern North Carolina is specially suited to these bulbs. I tried some thousands of them in the dry soil of the same hill region at Southern Pines. When these were forced in New York they bloomed earlier than the imported ones, but made smaller spikes. This was owing to the premature ripening of the bulbs in the hot sandy soil. This would not be the case in the moist black sandy soil of Magnolia, where the water table is but a few feet below the surface. When the growers learn how to handle the Romans they will be produced there profitably for less money than the imported bulbs bring, and when this is done the importation is over. The White Italian hyacinths do splendidly with us and make bulbs as large as the Dutch, but there is not a large demand for them. Dutch hyacinths will be better grown in a colder climate.

The Polyanthus Narcissus, like the Roman hyacinth, need to be planted late, as they start at once when planted early, but succeed finely with late planting, the paper whites make very fine bulbs, and the Chinese sacred lily makes bulbs that bloom more quickly in water than the Chinese. In brief the prospect is that eastern North Carolina will, ere long, be the supplying region for a great many of the bulbs now imported, and there are sections on the Eastern Shore of Maryland where most of these things can be commercially grown, for I have grown as fine tuberoses there as are grown anywhere. Amaryllis Johnsonii makes immense bulbs with us. I sent to a Chicago house 100 bulbs that filled a flour barrel. They bloom all summer through in the open ground and by packing closely on a moist cellar floor I keep the roots alive all winter ready for forcing at any time. Gladiolus of the newer Groff hybrids increase remarkably, and I find that those that make few offsets make plenty of seed, and we can grow them from seed in one season to bloom the next. These, too, will do as well on the Eastern Shore as anywhere. The Gladiolus is perfectly hardy with us, and from the little offsets that are left in digging it is rapidly becoming a weed in my grounds. Cannas, too, we find winter much better where they were grown and can be lifted and divided in the spring for sale. But the larger growers lift them in the fall and pile in winrows across the field and cover with earth so as to clear the land for other things in the fall.

But I fear that the length of this paper is wearying you. We are, I believe, on the eve of a great development in horticulture in the South, and that the wise growers of Maryland should share in this development. We have wasted too much time and labor in extensive work and all need to learn the value of intensive work and the use of glass.

DISCUSSION.

Question: How is it possible for you to get tomatoes so early?

Prof. Massey: That was nothing extraordinary. I have more than once gotten them that early in Kent County. On that occasion I was growing them for the Baltimore market. I started them in the greenhouse, sowing the seeds about the first of February. In other words, I always found that ten weeks before we could safely put them in the open ground, was the time to sow them. In moderate temperature I kept them in a hardy condition. I had plenty of big red tomatoes the 24th of June. There is great trouble to grow tomatoes in North Carolina on account of blight. I don't believe that it is possible to produce them commercially as in Maryland.

Dr. von Herff: Tomatoes are successfully raised in Florida, and are successfully raised in Maryland here.

Prof. Massey: The same trouble is everywhere along the South Atlantic coast. They have the same trouble in Florida. They cannot begin to grow them as they grow them here in Maryland, on account of blight. In the central and eastern part of the State the Southern blight is very bad. I believe the tomatoes are more healthy in the western part of the State, but it is intensely bad about Raleigh, and I don't believe that tomatoes can be grown profitably for canning in any of the central and eastern parts of North Carolina. I would not undertake to grow them by contract for $50.00 per ton.

Mr. Blessing: Do you spray with Bordeaux?

Prof. Massey: There are two forms of blight. With one form the spray is good, but with the other, it won't do anything whatever.

ADDRESS OF W. A. TAYLOR.

President Kerr: On our program there is allotted a period for addresses by visitors from any section or by members of the Society.

There are several gentlemen here who might favor us with interesting and instructive remarks on matters pertaining to horticulture. Perhaps Professor Taylor would favor us with something. We will be glad to have you favor us with a few remarks and observations as to what you have done for the good of horticulture in this and former years.

MR. TAYLOR: I had not anticipated being called upon for any sort of address, and therefore am not prepared to discuss any particular subject. I thank you, however, for your kind invitation and for the opportunity that is given me to speak of our work in connection with fruits in the Department of Agriculture. The Department of Agriculture is conducting investigations and experimental work along many lines that affect fruit culture, and the individual investigators are always glad to hear from fruit growers regarding questions that are of interest and importance to them.

Perhaps I might say a word with regard to lines of investigation under way that are distinctly in the pomological field. One of the most important of these at present is the effort to increase our export trade in fruits and to improve the methods of marketing and storing our fruits for both foreign and domestic markets. This takes in the whole question of cold storage of fruits both on land and in ocean transportation. One phase of this work which may interest your members is our effort to determine the practicability of shipping summer apples from the Chesapeake Peninsula to Europe. Three shipments of such fruits were made last July to London, two of these going by express and the other by freight to New York—all of them going forward in refrigeration on the steamers from New York to London—and good results as to condition of fruit and prices received, almost without exception, were realized.

We have demonstrated apparently beyond question that when the time comes that there is a sufficient quantity of good summer fruit to make carload shipments for export, the market is awaiting it on the other side of the ocean. This is true for good, red apples, such as Red Astrachan, Randolph, Early Strawberry, Williams, etc., and in some cases for lighter-colored fruit such as Yellow Transparent and Early Colton. The market reports on Williams, syns., *Williams Favorite, Williams Early Red, etc.*, were especially good. High prices were realized; it packs and carries well, and we believe that it will be found a profitable one in the export trade. This variety for some years has been shipped in a small way from Massachusetts, but other early sorts had not been tried until last year, when our efforts to export summer fruits from points further South began.

The English markets receive few good apples from June until the middle of August, the principal receipts being from Portugal. The Australian and Tasmanian winter apples picked in their fall, which is our spring, reach the market in April and May and are practically out of sight by the first of July. We therefore anticipate an increasing demand from the United Kingdom for fruits of this class.

Our work in the east with peaches was seriously handicapped this year by frost in the spring and heavy rains in the summer. Georgia peaches were of poor carrying quality and we made but one export shipment of that fruit. It was a shipment of Thurber, which reached the other side in rather poor condition. I doubt whether in a rainy season, peaches grown and harvested in damp weather could be successfully exported. Elberta grown in Oklahoma and shipped in August to New York by ordinary refrigerator express, and then in refrigeration to Liverpool, reached the latter point in beautiful condition. They realized about $2.16 per six-basket carrier on dock in New York.

We are glad to say that the work of the Department along this line of developing export trade in fruits is being followed up by commercial shippers. While prior to the work of the Department in 1901, eastern Bartlett pears had not been exported in a commercial way, this year more than sixty-five carloads of this and other summer pears were exported by private shippers. Reports indicate that the shippers have realized very satisfactory results on these exports, and the outlet thus afforded promises to give a measure of relief in seasons when our surplus of such fruit is greater than desirable from the standpoint of the grower.

Just at present a series of carload shipments of winter apples is being made,—several varieties in carload lots are being shipped in boxes and barrels, using the same grade of fruit in each. There has been much uncertainty in the box-barrel discussion that has been on for some months past because, in general, the apples that have been shipped in boxes are higher grade fruit than those shipped in barrels. We are shipping identical grades of fruit in both packages in order to get at the actual preference of the markets where the fruit is alike. It costs more to pack the fruit in boxes, though in a year like this, the boxes themselves probably don't cost more than the barrels. Ordinary apple barrels have cost as high as from 35 to 45 and 50 cents each in the northern winter apple districts this year. Boxes holding 40 pounds which can be had for about 12 cents each, are about as expensive as barrels at 45 cents each. It is the purpose to continue these shipments, so as to cover the whole winter apple season. At the same time we are testing the relative value of certain wrappers, and whether it is really advisable to wrap winter apples. Sales and reports thus far are contradictory, as to the value of both wrappers and boxes in the markets tested, and some very interesting contradictions have come to light. For instance, in a shipment of Baldwins made last year to the Glasgow market, the unwrapped apples sold for something more than the wrapped apples did. The seller reported that the buyers wanted to see the fruit they were buying. Later in the season our consignee reported that the men who bought the wrapped apples stated that he had tested their keeping quality in contrast with unwrapped ones, and that the wrapped fruit kept so much better and that he wanted them wrapped hereafter. In our first shipment to Glasgow this year, the wrapped fruit sold above unwrapped fruit. The same party was after the wrapped fruit this year, and willing to pay more for it. This question of package and style of packing is one that cannot be settled by one or two shipments, and will only be settled when we have the general result of a somewhat complete and comprehensive series of shipments, covering the various varieties and markets.

We have in our fruit storage work duplicated a number of tests that had been conducted for two seasons before, realizing that it is unsafe to generalize from so few tests. After another season's experiment we have no change to make in the recommendations regarding storage of peaches and summer pears that were made, I believe, to this Society by our Mr. Powell last year. Recent observations indicate that there is a very distinct tendency to earlier development of scald on winter apples from young trees, both in cold and common storage, than from mature trees of the same variety grown under the same conditions. This is especially true of York Imperial and probably holds good for many other varieties.

PLANT BREEDING.*

DR. H. J. WEBBER.

Gentlemen and Ladies: I fear that it is something of an imposition for me to attempt to address this audience, but if there is any shortcoming, you must blame your President and Secretary. You probably know that I am dealing mostly with Southern crops and so can have very little to say regarding Maryland plants; but I was assured by the Secretary of your association that what you wanted was a general talk on plant breeding, and something in regard to what can be accomplished on scientific methods along that line. I trust, at least, that it will suggest something, which may be of value to you, and which will lead you to a line of improvement of your own crops.

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*Owing to the darkening of the room for the lantern exhibition the stenographer was unable to get a good report of Dr. Webber's very instructive and entertaining remarks

Now as I go around the country I am asked in wonder, "Can we breed plants as we do animals?" Ignorance of this subject is too general. For advanced farmers to be entirely ignorant of what can be accomplished along this line of breeding, will not do. They hardly know that there are males and females. We need to know more. We need to know of it intelligently, and I hope we can do something toward opening out this subject.

It is not an old subject, only about a century. James Andrew Knight made the first developments along this line in the very things in which you gentlemen are interested. He showed us that we can produce new forms by introducing the pollen of one flower into that of another and securing the combination of these characters. He was followed by another worker who worked the principle of selection, which is to sow, select and resow until he gets what he desires.

In early days we got our orchards by introducing the pears and apples, etc., from England. But if you look at your present list of apple or pear varieties, you will find that very few of your fruits come from abroad. They are of American development and ingenuity. In the gradual development of horticulture it was found that with this development new varieties are needed. New regions must have new varieties, and effort and intelligence has been spent in developing other varieties for these conditions of the climate and soil. We find that the varieties must suit the climatic and soil conditions of the country. It is a duty of the breeder to find out the climatic and soil conditions and modify his plants to suit these conditions.

Some one asks "Why, we have very nice apples and pears, and fine corn and wheat. What is the use of going any farther?" Every man who tills the soil in any form realizes that the conditions are becoming more severe, that competition in trade is more severe, and therefore the conditions demand of us something better to meet other conditions and the line of extension is advanced. A story told me the other day brings this out. A man had lived on the farm for years, and when, one fall, he found taxes very severe, moved to the city. He wanted to keep live stock, and so went down to the tax office to know what was untaxable. He found that the only live stock which was not taxable was goats. He purchased a herd of goats. When the tax receipt came, he was charged $8.00 a head for the goats. He went down to see the tax collector, and explained that he was told that goats were not taxable. The man told him, however, that all property abutting and abounding on the street was to be taxed $2.00 a foot.

We were speaking, to a certain extent, of plant variations. These individual variations only carry us a certain distance; now we want very striking variations, great jumps that take us over into another field, and we have to direct our energies somewhere else. Now, fortunately, if we examine plants, we find they have a habit of jumping,—and we can use the plain, ordinary word of "jumping "for some plants for some unknown reason will vary by jumps, giving very striking variations. But that is not all. If we are expecting to make great advances we must know what we are looking for. The intelligent plant breeder should know exactly what he is after. He must realize the problem and go after it. If we try to combine the tender orange of the South with the more hardy one of the North, we must therefore select proper parents, and breeding them together, hybridize them and get what we want. That gives us far greater possibilities than we can get in the line of selection. But if you read books on general plant breeding, the main thing is selection, and if we desire simply to procure a strain of corn or wheat, it is very true that a judicious selection will give a greater and surer result.

Now we will have the slides. [A fine series of lantern slides showing processes of plant breeding was shown and discussed by Dr. Webber. After showing the slides, Dr. Webber said:]

I feel so intensely the necessity of impressing the matter of seed improvement that I never let the opportunity go by. We find them studying fertilizers and the kinds of plows but I have found very few farmers paying attention to the kind of seed to grow. I tell you, gentlemen, that it does not take second place to plowing and fertilizers. It comes first, and is very important. I thank you for your attention.

ORNAMENTAL PLANTS FOR HOME GROUNDS.

CHAS. L. SEYBOLD.

The founding of a beautiful home is the most enjoyable occupation, and much pleasure and happiness is derived from devoting a few hours every day to the care and beautification of the home grounds.

The landholder who is fortunate enough to own a country home or a piece of suburban property of sufficient size, should by all means, study the future development of his grounds, and he should try to make the landscape effects as artistic and interesting as possible. Whatever is done should be done with a thoughtful mind, for Schiller has well said

> "This forms a man's chief attribute
> And reason to him is assigned
> That what his hands may execute
> Within his heart, too, he should find."

Very often we are confronted with various situations and perplexing conditions, but the experienced landscape gardener must be able to solve the most difficult problems, for, the fundamental principle always remains the same. I will try to explain this principle in as few words as possible and to the best of my ability.

Everyone has a hobby, and most well-to-do country and suburban home owners are generally inclined towards gardening and flowers; they spend a great deal of money on ornamentation, which, in the majority of cases, turns out to be a dismal failure.

In every American residence from the palatial mansion of the multi-millionaire, surrounded by wide stretching grounds, and ablaze with gorgeous hues of Flora's fairest children, down to the last geranium pot on the window sill of the modest hut, are found flower enthusiasts. Some of our parks and private places compare favorably with the best European creations.

In designing a landscape plan for an extensive estate or public park, and where sufficient lawn space permits the planting of various groups and specimen trees, the landscape gardeners' opportunities are better. A greater latitude will open very often unforeseen and picturesque perspectives. The immense irregular sweep of border plantations flanking an open, well-kept green sward, with here and there a group of solitary specimen trees of weeping and globe-shaped varieties, dressed up in the rear with a good skyline of pyramidal or spiral trees, will make a most artistic landscape. These so-called sky pointers which rise well above the round-headed trees, are indispensable for completing such a planting scheme.

This style of planting can be imitated on a suburban place of limited size; but a variety of smaller trees and shrubs of the same style of growth must be selected, and very often the space is so limited that only a few specimen trees of large size can be employed, and their proper position depends altogether upon the location of the house and the other conditions. The landscape gardener should know at once whether a system of geometrical balance, of the natural style of planting is required; only an experienced hand can bring out the points which will eventually constitute the main ornament of the grounds. There is no reason why an inexperienced man should be employed to create a garden park, or that he should be allowed to despoil a naturally well-developed tree of a low-branching habit by cutting off its lower limbs, or make other more serious mistakes. One of our greatest American landscape gardeners has well said, that there was no greater field for an ignoramus or downright imposter than that of gardening, for very often, the imposter has time enough to depart before his incompetency is discovered.

The great desire for quick and plenty of shade around the house misleads the suburbanite to plant a large number of the fast-growing but short-lived Carolina poplar (cottonwood). This mistake is nowhere so generally practiced as in Maryland. The Carolina poplar, in my opinion, has but one mission in planting schemes, and that is, as an intermixture with better and long-lived trees; it should be cut out after the latter have grown to a sufficient size.

I am glad to see that a new and progressive road law is being enacted by our legislators; there is an abundance of very good material for road building in almost every section of the State; such a law will encourage the farmer and suburbanite to pay more attention to the matter of ornamentation of home grounds; the old cattle fence will disappear and a beautiful California privet or thorn hedge will take its place along the highways. Both questions go hand in hand, and, good roads are a benefit to all around, they increase the profits of the farm by reducing the cost of transportation, and one horse can do the work where it now takes two.

The question of ornamentation of home grounds has been very ably discussed by members of this Society on previous occasions, but the secret of success lies in public education and practical illustration of the different branches of horticulture. I believe in following the laws of nature by sowing the seeds of both theoretic and practical knowledge into early youth, in our public schools. I have advocated the establishment of public gardens of instruction in our parks and I hope we will realize it before long.

The question has often been asked: Of what utility to science, of what help to the amateur are such associations as this, or the gardeners or florists' clubs? Through the medium of the press, the good work is being revealed from time to time. To my mind the greatest question which confronts us to-day is: How can we dispense horticultural knowledge to the amateur in the easiest and most practical way? I leave this question to be answered by some of the bright lights in the profession. Our Maryland press and the very able horticulturists which this State has produced have always been foremost in dispensing horticultural knowledge, and it may be interesting to note that the first agricultural paper in the United States was *The Maryland Farmer*, which was published in the year 1819 in Baltimore. The first and foremost researches were made, and have been recorded at our Maryland Agricultural Experiment Station. The first Horticultural Society was organized in New York also in the year 1819.

Our State is blessed with the best climatic conditions, and we can boast of a most beautiful and diversified landscape. The help of the farmers and gardeners, together with up-to-date roadways will eventually make this State one grand and picturesque park. One neighbor should set a good example to the other by doing something towards beautifying his home grounds. State and civic pride should be cultivated among our people, and if a stimulus is needed, let us enact laws to encourage such work.

Many instances are on record, where a place improved at an outlay of a few hundred dollars for outdoor planting has increased its value tenfold. Before planting trees and shrubs a careful selection should be made as to height, style of growth and the tint of foliage and color of the flowers. For instance, a large, irregular border of flanking on one or more sides of an open lawn, should have the lofty and tall growing varieties placed well in the rear; the feathery growth of foliage and blossoms of tamarisk, sumach, fancy acacia and others should be well intermingled with other kinds, such as althea or rose of Sharon, lilac, purple-leaf plum, magnolia, viburnum or snowball and Cystissus Laburum or golden rain. All should occupy a position well to the rear of the border and from 6 to 12 feet apart according to the variety. This style of planting should include in addition to those mentioned the forsythia or golden bell, the jasminum, spireas, deutzais, weiglia, mock-orange, hydrangeas and others; this will insure continuous bloom from early spring until fall.

The front of such borders should also include a collection of the best hardy perennials and annuals: paeonias, iris, delphinium, digitalis (fox glove), dianthus, dahlias, hibiscus, gaillardias and others.

Tall and graceful ornamental grasses can be planted in groups or as single specimens upon the lawn and in the border. If the space back of such a border permits the planting of large trees, for a distant background and good skyline, it will be so much more complete and artistic. The best trees to be used for such a scheme are: horse chestnut, golden and weeping elms, ash, lindens, maples, white birch, copper beech and Japanese willows. A few groups of Lombardy poplars, say three in a group, should be used for a skyline, to tower above the round headed trees; these trees are known to be fast growing skypointers and are indispensable for such work; coniferous and evergreen trees and shrubs should be planted if the grounds are of sufficient size to permit the same.

A sunny corner for a variety of old fashioned flowers with a bed of monthly blooming roses should not be forgotten. A hedge of roses is a thing of beauty, provided good soil is given and the proper selection is made: for general effect the everblooming Bengal roses are best; Queen Scarlet, Louis Phillipe and Agrippina are most excellent for a hedge. The colonial magnolia rose and other half-climbers (James Sprunt) are also very good for such a purpose.

Crab-apple trees are both useful and ornamental. They grow to a height of 25 feet and are covered with a wealth of fragrant rosy blossoms in the summer, and in fall their glossy and bright-colored fruits are highly ornamental; in connection with this I wish to say that the almond, Japanese persimmons, bird cherries, murrillos and hazel all could be used in landscape effects.

The planting of permanent vines for porch, arbor, walls, etc., should not be overlooked; for this purpose we have the akebia, wistaria, cobea, star clematis, ivy and other vines. A hedge of hawthorn, California or Japanese privet or spruce should replace, as I have before stated, the old and antiquated fence along the public highway.

I often wonder why the grower of early trucks does not plant a few rows of Norway or white spruce along the northern and western boundary line of his truck farm to protect his early crop from the cold blasts of the March winds. The spruce could be planted of two-foot nursery stock, which is very cheap, about four feet apart; they can be thinned out from year to year just before the Christmas holidays without impairing the usefulness of the hedge and then are a source of revenue. In going back to ornamental planting, I wish to say that for a small place, especially, it is necessary to keep up a perfect lawn, particularly between the road and the house proper, or else the whole arrangement would look untidy and inharmonious. Deep plowing and good soil is most essential for good growth and moisture. A planting plan is necessary for larger places, and in order to avoid mistakes the accurate position and proper name of the trees or shrubs should be indicated each by a number; then again the system of planting should be so arranged as to hide, to some extent, at least, the objectionable features, such as fences, outhouses, barnyards, stables, etc. All harsh outlines, straight lines and sharp angles should be obliterated. While in Europe two years ago I have seen this rule carried out to perfection, and this general rule prevails almost everywhere.

On one occasion upon a private place, I noticed a fine system of irregular borders and a beautiful hedge walk which attracted my attention, and being curious where the walk led to, I passed through, expecting that it would bring me to a building, a spring or garden parterre; to my surprise, however, I landed in a lot of pig-pens and chicken yards. Everything objectional was so carefully and artistically obliterated from view, that nothing unsightly could be seen from any part of the beautiful grounds.

Happy, it is said, is the man or woman with a hobby, and, if he or she acquires a hobby for the beautifying of the home surroundings with trees, shrubs and flowers, there is no reason why they should not be extremely happy and contented.

MARYLAND HORTICULTURE AT THE LOUISIANA PURCHASE EXPOSITION.

WM. L. AMOSS.

I hardly know where to begin as it is a broad subject, and we are on the last session. I hope that you are all convinced that Maryland should have an exhibit at St. Louis. These large exhibitions are like our great nation taking stock. No one can afford to not look over his business at least once a year, and a great nation like this should, each ten years. And they are going to have an exhibit there that will be the largest ever brought together. There will be more money spent at the exposition and more ground covered for buildings than ever before, and I feel that we cannot, as a State, not be included among the exhibitors. A few years ago I made a tour through the West, studying conditions and visiting fairs. I wanted to learn what was being done for young men and women.

In a fruit exhibit in Iowa, there were only two pears. When I went to Minnesota, there was a beautiful exhibit of fruit, of apples particularly, and it was very attractive, large and well arranged. I said right away, I must see where it came from. I learned that it came from the Powell Nursery and understand that it is one of the best and leading nurseries of the Northwest. I went there and was surprised to find that they had borrowed their exhibit. Half of the apple trees they had planted had been frozen out and I learned afterwards that they had gathered the fruits at this State exhibit from all who had bought trees from them, and from that they had made this large exhibit.

I was told also by a Mr. Knight that there was no difficulty in selling Maryland peaches out there, if they would make an effort with the railroads to ship directly and promptly if properly picked and packed. I might take up some time in this way telling of the demand for the eastern fruit, especially the Maryland fruit in the West. I know they are gaining very largely, but yet there is a large demand for them. Michigan supplies good fruit, but we come in when Michigan fruits are not ripe. So I feel that there is an opportunity in having our fruits exhibited at the Exposition.

The purpose in making such an exhibit, should be to advertise this State of Maryland. Probably those who have lived here all their lives, think that unnecessary. Now it is a fact, that at least half a dozen men to whom I was introduced in the West asked where I was from and when I told them then they wanted to know where it is. I told them it was a little State on the Atlantic, where we enjoyed so many blessings of God that the outside world knew nothing of.

There are three reasons why we should make this exhibit. There is a large territory here that is in the market. There are five counties of this State that can be bought for a little over $10.00 an acre, and yet these lands are fertile, unusually so, and it is possible to cultivate them as well as any lands in the State. We also have thousands of acres of land in the western part of the State for grazing and fruit-growing. This is due to conditions existing among farmers that have been farming on the large scale, up from slavery and afterwards by hiring labor. I have no encouragement to offer that this labor will be increased. You heard a lecture last night by a Washington man, that should impress you of what the Government is doing. Every effort is being made by money and men to force upon us intensive agricultural methods. Millions of money is spent in it annually. We are up to a proposition of this kind: that we must follow these methods. The large farmers are solving these problems by doing it as large department stores or trusts do. I feel that our farmers must be helped out and we must center our efforts to such arrangements. We must have capital, and to get that must sell some of the land. Intelligent men of the western country are seeking homes here, but they must be informed of our opportunities in that line. Some are coming south and we need to encourage them. I was fortunate enough to meet Professor Henry of Wisconsin in Washington, and he asked me something of cheap lands in Maryland. I told him if he wished, I would show him some fine land at $20.00 per acre. He had in mind to settle his son in the East, and his thought was to get him as near to the New York market as possible.

I frequently get letters from western men, asking about our lands. I was interested at these western fairs in an exhibit of soil from Manitoba, arranged so that you cloud come in and examine it. They had a very attractive exhibit, and had a man there to explain the possibilities of that section and give all the information necessary. I thought then if our departments would give such an exhibit of Maryland soil and produce, that it certainly must have a great influence on our future.

An appropriation by the legislature gave $25,000 to a commission appointed by the Governor to make an exhibit of Maryland resources. Familiar with horticulture and agriculture, and having traveled much over the State, I have been asked to take charge. I was instructed not to exceed $5,000, for those two subjects. We have made preparation for the horticultural exhibit, and one that cannot be made on $5,000, but we know what the horticultural interest of the State is and what it can do when shown up well, and we have taken upon ourselves to collect through the assistance of the Horticultural Department at College, 230 bushels of apples, 25 barrels of sweet potatoes and some pears and put them into Washington cold storage, and they are ready to ship to St. Louis. They have been largely contributed, but we found that some must be bought. Missouri, I am told through the gentleman of the Department, has, in cold storage, 1,000 barrels of apples, for which she paid $6.00 per barrel. While some did not cost that much, they got good fruit. I find that in traveling among our farmers, they sell their orchards to one man, picking and piling on the ground, the purchaser furnishing the barrels, etc. The man does not want the best picked out, and leave the culls. It is necessary to go to the buyer and get the good fruit. I was told in Illinois that to get apples in a certain county, you buy the orchards in the whole county and thus arrange with the buyer. I don't think we need as much in cold storage as some of the Western States, but starting the first of May arrangements should be made here to allow us to select, pack and ship fresh fruits, and keep a continual display of fresh products there from the first of May, when strawberries ripen, to the first of December.

The next is to learn where to get it. For this purpose I sent out thousands of cards and got back one or two. I sent out five thousand of another kind, and got back about 150. I am circulating at our Institutes strips which cover important products of the State and ask our orchardists to check what they will let us have, and will grow so that we may have a record of what is given and know where it is. If that fails, the only thing to do is to send one in each county to buy, pack and ship what is needed. If we make the exhibit, it is necessary to get the best, and promptly, and write to our agents in St. Louis to arrange as new products come in. Of course, such work will require money, and a bill will be introduced in the legislature in a few days and an effort made to get enough funds to not only make the horticulture and agriculture exhibit but to get a State building. The farmers' organizations are asking that they devote to agriculture and horticulture $15,000. From inquiry made, I think it will take that amount. I wrote to Prof. Taylor for amounts and the following is his answer:

> "Concerning the comparison of the amounts of this State with what other States are doing, I am pleased to say that very few States will fall below the amount you are asking for at the present time, and a large number of States will use that amount in each department, horticulture and agriculture."
>
> Signed F. W. Taylor.

I could tell you a good deal about the difficulties of finding where these products are, but I would say that we need the assistance of every man. We need to know where the products are, and we want to show cotton, maple sugar and everything, so that strangers may decide whether Maryland should be their home, and I believe if the young men turned out by the western colleges, who know the advantages of good means of transportation, who know how to handle the soil if informed of them would take advantage of our opportunities. That is the class of men we want. We want no foreigners, but the most intelligent class we can get.

DISCUSSION.

President Silvester: I trust that this intelligent body of horticulturists will not permit this opportunity to pass without unanimously endorsing this application for the State Commission; and in addition not to rest simply with endorsement. Individual members should urge upon their respective representatives in the Senate and House of Delegates the importance of acting favorably on this petition. This exposition is to be the largest that has ever taken place in the history of the world. All nations, all States and public and private institutions will be there on dress parade. Their resources will be magnificently displayed. The ingenuity and liberality of men will be taxed to their utmost to make a creditable display of the resources of their homes. Pride of nativity will call for this. What native of Maryland stood in the presence of that complete exhibit from a mineral standpoint at both Charlestown and Buffalo, but felt a thrill of pride when he saw the Maryland flag draped around and the Maryland shield capping an exhibit from his native heath which proclaimed his State, "*Primus inter pares.*" Dr. Wm. Bullock Clark, the collector, transporter and architect of the exhibit, deserves the thanks of every native of the State for his masterful work. Maryland has never been even fairly represented at any of our great national expositions from the agricultural and horticultural standpoint. Few have any idea of the resources of our State from these points of view. With a master hand to collect, transport and install such an exhibit, as the agricultural and horticultural resources of this State will supply, would give to the world a revelation little dreamed of at present. From the mountains to the sea every range of temperature, precipitation and soil condition necessary to produce a wide and varied agricultural life exists. Let us see to it that our interests are properly represented at this exposition Means are absolutely necessary to encounter this end. Money thus spent will be wisely devoted to the best interest of your native State. As a member of this Society I feel that I would be derelict in my duty to my State if I did not strongly urge upon you the importance of your hearty support of this measure.

Mr. Hartshorn: I did not hear all of what Mr. Amoss said. I have been interested, and know he has done good work, and we should have a live exhibition, and not a dead one. I would like to see at least $15,000 appropriated to agriculture and horticulture.

President Silvester: Mr. Chairman, if you were at Chicago, if you were at Buffalo, if you were at Charleston, and saw the exhibits that were made to represent Maryland at three of these expositions from the standpoint of an agriculturist and horticulturist, and had been standing over it, and if a man had passed and asked what you were admiring, you would have been ashamed to confess that it was from your native State.

Mr. Brown: I wish to say that what the Captain said, is true and that I was placed in just that position.

Mr. Seidewitz: I favor the motion heartily, but with all the endorsement that we can give this matter, our individual work will do much more.

Every member of this Society should make it his business to write or see his delegate at Annapolis and urge this matter. While the delegates may favor this matter they may become careless or negligent about the same, especially if it comes up the latter part of the session, hence the necessity of reminders from time to time from those who are interested. Those who saw the exhibit at Buffalo, should see to it that we make a better showing at St. Louis. Every citizen who is interested in horticulture should make a demand upon the Assembly to make an appropriation ample to have a fine display at the coming fair at St. Louis.

PRESIDENT SILVESTER: I believe that the effects of the endorsement will have its influence, just as much as individual work, and heartily believe that both should be used. I want to see it in the press.

THE TREE PLANTER'S INTEREST IN PROPAGATION.

PROF. F. A. WAUGH.

The subject is one of great general interest and yet one in which our knowledge falls very far short of our requirements. Considering its importance and the long time it has been before the public it is remarkable how little we really know about it.

The tree planter or fruit grower and the nurserymen stand in a peculiar and important relation to one another. Each one is absolutely dependent upon the other. The business of fruit growing must be successful or the nurseryman fails. The nurseryman must be able to conduct his business at a profit or he cannot supply trees to the tree planter.

Notwithstanding this absolute interdependence these two classes of men have not always worked in strictest harmony. Indeed there has ever been a noticeable amount of friction. The ordinary fruit grower considers the nurseryman a fraud, and the nurseryman thinks the fruit grower a fool. I have no doubt that in some cases they are both right; but in the majority of cases it must be true that they simply misunderstand one another. We must assume that for the most part the fruit grower knows what he wants; and we must believe equally that the majority of nurserymen understand their own business. At any rate we must accept as fundamental to the consideration of this entire question that any settlement between tree planter and propagator must be on such a basis that both men are satisfied and both lines of business are made prosperous.

Now when we come to consider just what service it is which the nurseryman performs for the fruit grower we find that there are many different things required. Primarily the nurseryman must furnish trees true to name, strong, healthy, and free from disease. But the fruit-tree planter often places other conditions upon the propagator. There are many other things which he wants or thinks he wants, some of them reasonable and some of them unreasonable. It will be well to take a look at some of the common notions regarding nursery stock.

One of the first prejudices which we meet is the old fashioned one that it is better to have nursery stock grown in the locality where it is to be planted. Of course, it is always more convenient and satisfactory to deal with a local nurseryman with whom we are personally acquainted. But this does not prove that his trees will really succeed better than those brought from a distance. I am convinced that this theory that local stock is best has often been strongly overworked, and that in many cases it has been presented in such a way as to become really a swindle. For instance I knew of a firm once in a northern State who made a great specialty of hardy northern grown trees, so called. The firm was situated in the centre of a particularly inclement section. The local climate was trying and severe. Many orchard trees failed on account of the hard climate. These men claimed that ordinary nursery trees were not sufficiently hardy for that locality and the buyers were told that it was dangerous to order from a distance. Only those trees grown on the ground and inured to all the hardships of 40 degrees below zero could be expected to do anything. Every year they sent their agents through the country peddling this story and selling their trees at three times the regular prices. When the agents came home with their order books full and the company found how many trees would be required to supply their customers the bulk of them were ordered from Geneva, N. Y. The man in Geneva was a jobber and got his trees wherever he could get them best—in Huntsville, Ala., Wichita, Kans., and the other sections where cheap nursery stock is grown. Thus year after year the supply of hardy northern grown nursery stock was made up from the large nurseries of the southwest. The trees all grew and flourished when they were reasonably well treated and thus the stories of the nurserymen were justified.

Aside from the prejudice in favor of locally grown trees there has been, at least in our section, a strong leaning toward those grown in the north. It is supposed that they are hardier. Some years ago I had occasion to put out a small plum orchard. Part of the trees came from the Eastern Shore of Maryland, and since Mr. Kerr is now going out of the business there will be no indelicacy in saying that they came from his nursery. In the same orchard I planted a considerable number of plum trees grown in Ottawa, Canada, which is about as far north as nursery trees are ever grown. These were planted together in the same field, and now, after a period of six or seven years I am able to say that the southern grown trees proved to be the better.

Every man who understands the present conduct of the nursery business knows that the trees we buy really do come from all over the country. No nurseryman grows everything he sells. When we buy a bill of trees from a nurseryman in Maryland, New York or Massachusetts, a part of them may really have been grown in Missouri, others in Alabama, others in Texas. The fact that they succeed uniformly shows that the place of their origin makes little difference. What we want when we buy nursery stock is good trees. We want a good, sound, healthy, hardy tree. It is nonsense to ask where it was grown or by whom, or what its politics were or the time in the moon when it was planted or anything else of that sort.

Another crowd of nurserymen has imposed on the public with a lot of stories regarding the merits of different methods of propagation. One man says that only budded trees are right. Another one says that only root-grafted trees should be planted. Another one wants whole roots crown grafted. I know that some tree planters do prefer budded trees and that some prefer whole root trees; but, privately, I am convinced that these preferences are due either to local and very peculiar conditions or still more often to personal prejudice. In my judgment it makes no difference whether the scion is grafted one end up or the other, or whether a whole root is used or none at all, provided only that the tree grows and grows well. One method of propagation may be more advantageous to the *nurseryman* than another. He may find it easier to grow budded trees than grafted ones. Or he may not. That is all his business, however, not yours and mine. What we want is a good tree. What he wants is the cheapest and easiest method of propagation.

I think I may mention another matter without going into it very far. It is one which has often been discussed before your Society, and one of vital importance. There are many reasons, however, why it should not occupy any special place in this lecture. I refer to the matter of freedom from disease. There is no use here in talking of state inspection, fumigation, and other matters of legislation. This is a long, long story and you have heard it all before. I have my own opinions in the matter but they might not be useful to you. What I should like to say in connection with the subject now in hand is that the tree planter has the right to demand that the nurseryman shall furnish him with trees free from insects and disease. I think it is still an open question as to whether a few woolly aphis on the roots of an apple tree should condemn it to destruction. I think it is true that some of the men who are talking of legislation on the matter are putting heavier burdens on the nurseryman than he ought rightfully to be expected to bear. Nevertheless I must say that if I were planting trees for myself I should see that they were absolutely free, as far as human efforts can make them, of all kinds of disease germs and insect pests. I would do this even though it cost two or three times as much to buy such trees. And I would not depend upon any official inspection or fumigation. I would look after that matter for myself regardless of the law. It doesn't pay to plant cheap trees.

Another matter which has been much discussed relates to the age when nursery stock should be planted. There has never been any particular issue between the tree growers and the fruit growers on this point; but different men have different opinions and we ought to see what they are worth. There are still a good many men in New England who like to plant out pear trees at five or six years of age. Occasionally apple trees even are planted as old as that. Those nurserymen in the audience will remember that a few years ago the demand was almost exclusively for two-year-old apple. In recent years there has been an obvious tendency toward planting younger trees. There are thousands of apple trees planted at one year old. Peaches are set at one year old. Indeed, during the last few years hundreds of thousands of peach trees younger than that have been put out. I refer to the planting of June buds, which are of course less than one year old. Some planters have gone yet further in the southern peach districts where men have gone peach crazy. They have been planting out large orchards of dormant buds—one year younger than nothing. I certainly do not believe that we can recommend anyone to go to this extreme, but I am heartily in sympathy with the modern tendency toward planting younger trees.

Let me now take up another matter which I would like to present more in detail. We understand, of course, that when a man buys a nursery tree it should be true to name. If he buys a Winesap it should be a Winesap and not a Ben Davis. There has been plenty of trouble on this point, and the difficulties between the fruit growers and nurserymen have very frequently been of this kind. I know an important suit at law now pending which turns on this very issue.

However, when a man buys a nursery tree he buys not only a top but also a root; and in practically all cases the root is of some kind different from the top. Our whole practice of budding and grafting, used almost universally in the propagation of nursery trees, is simply a means for securing a combination of this sort. It insures that there shall be always these two parts, different in their nature, which must live together throughout life and get along as best they can.

Now if the root retains its nature as well as the top it is quite obvious that it may have some influence on the result; and if that is the case the tree planter must have some material interest in the former as well as in the latter. In fact, this interest is already recognized in some cases. For example, plums are frequently propagated on peach roots as well as on plum roots. Many tree growers order plum on plum or plum on peach as they consider best for their situation. This shows that they recognize the fact that their trees consist of two parts and that they are entitled to get what they ask for below ground as well as above.

There is at the present time a growing tendency to call for dwarf apple trees; and the propagation of dwarf apple trees requires the use of special stocks. There are particular reasons for this present demand which make it seem likely to continue. One of the greatest reasons is the San José scale. The San José scale seems to have stopped with us to stay. It promises to be an important item in our fruit-growing business for years to come. We are expecting an annual campaign with it for the next few hundred years, and to prepare for that enterprise we are making various changes in our methods of orchard management. One of the most important of these changes is the growing of smaller trees. Men used to grow apple trees 40 to 50 feet high, but when the San Jose scale gets on a tree like that there is no way to dislodge it. In order to fight such insects as the scale and in order to manage the trees in other respects as modern conditions require, it is necessary to have shorter trunks, lower heads and a more restricted spread of branches. This is why small trees are the vogue and this in turn is what makes men interested now in the propagation of apple trees on Paradise and Doucin stocks.

We find further that we can affect not only the stature of the tree by selecting a suitable stock, as in the case of dwarfing, but that the age at which the tree bears may be influenced. As a general rule, to which I do not now remember an exception, any dwarfing stock brings the tree earlier into bearing. This has long been recognized with pears and apples. I have often seen dwarf apple trees bear the first year planted. In an experiment which I conducted with plums I found that the same varieties planted side by side would bear at least three years earlier on certain stocks than they would on others.

The stock influences not only the stature of the tree and the age of bearing but the general productivity of the tree. In general it may be said that the productivity is increased by any stock which tends to dwarf the growth of the tree. In most cases, however, this is not an important matter. Over-bearing is more prevalent than under-bearing; and if we take advantage of this principle at all it will be not to get greater yields from our trees but to save them the expense of overcropping.

The character of fruit is also affected by the nature of the stock. In some cases the change is striking. I had a very interesting case called to my attention a few years ago in Vermont. There was a row of McIntosh apples growing beside a row of crabs. The crabs were worthless; the McIntosh were fine. The owner therefore grafted the crab-apples from the scions of the McIntosh trees. When I saw them both rows were in bearing and both bearing McIntosh. Nevertheless, those worked on the crab trees were larger, very much redder, firmer, and kept a month longer than those from the original trees standing in the adjacent row.

Some of these points have not yet passed the experimental state. We only know that such influences sometimes make themselves felt. In only a few matters have we been able to take advantage of this knowledge and to put it to use commercially. The time is rapidly approaching when we must do more of it. We have to understand the business better than we did ten years ago. There are more fine points coming up every year. We shall be obliged to make improvements. It is not too much to expect that in the near future we shall be taking advantage of many of these more difficult points and will be helping ourselves in many ways which we do not now understand. When we look back fifty years and compare the practice of that time with the present, when we see what progress has been made, when we see what things are now done on a large commercial scale which at that time had not been thought of, then we have every reason to hope that the progress of the next fifty years will solve for us a great many problems which as yet, we have hardly begun to think about.

DISCUSSION.

MR. COHILL: I would like to ask about apple trees. If pruned in June instead of winter, would it aid toward dwarfing the trees? Is there any objection to that?

PROF. WAUGH: No, sir. That means, if you know what you are doing, and not overdo it. I would not do so the first and second years. We find them a little slow in establishing themselves and think it best to allow them to grow the first year until established. If there is too much growth, prune in summer.

Mr. Cohill: Is it better to prune in summer, rather than winter? Which is better?

Prof. Waugh: Both. I mean one is just as good as the other. A man must keep his trees at the proper size to develop and some believe it is best to prune in winter, and some in summer.

Mr. Hartshorn: I would like to ask if in budding on different stocks that way, whether the tree itself has much influence on the root, that is, will that stock remain the distinct stock or will it become the root of the tree to which it is budded?

Prof. Waugh: That is an awfully easy question. I might say that I have made one or two observations, and they have satisfied me that the top does have direct influence on the root. And the root is frequently influenced by the character of growth of the top. We don't see it and don't appreciate it. But, theoretically, you can expect the root to be influenced, as much as the top. In some cases it is so.

Mr. Towson: I would like to know if you favor deep cultivation and plow a tree; or shallow.

Prof. Waugh: We cultivate as deep as we can.

Mr. Towson: How deep is your soil?

Prof. Waugh: Anywhere from six inches to sixteen feet.

Mr. Towson: We could not plow six inches deep without hurting the root, and possibly plow off the roots.

Prof. Waugh: Do you mean to say that all roots are within six to eight inches from the top.

Mr. Towson: On peach, not on apple.

Prof. Waugh: It makes no difference as long as the main roots are not cut. The surface roots will take care of themselves.

Mr. Towson: It must be done early in the spring.

Prof. Waugh: Yes, sir. Shallow in the spring and deep the rest of the year. We plow as deep as we can, within two or three inches of the roots, and six inches in the rows.

Mr. Davis: Do you supplement that method with cover crops?

Prof. Waugh: Yes, sir.

Mr. Towson: I would like to ask if Professor Waugh favors open top, or the other—umbrella-shaped top.

Prof. Waugh: I don't believe that can be answered by anybody. You ask me if I favor it? As far as I am personally concerned, I use both methods. I think with many men it is a matter of taste.

Mr. Cohill: In the case of dwarf apple trees, which would you prefer, the open top or the straight?

Prof. Waugh: I don't know.

Mr. Hartshorn: I would like to ask if Professor Waugh knows of any stock that will increase the age of stock, if budded or grafted on it—any that will increase the age of the Japanese plum?

PROF. WAUGH: I know that it will die quicker on some than on others. On our experimental ground in Vermont, we were unsuccessful with all plum on peach stock. They would not grow at all. The soil was heavy and the climate cold, and it might be that the peach was not suited to the soil. I have seen whole orchards of plum wiped out because the union was not good. The trees did not thrive on the stock. I cannot say which stock is the best.

MR. MILLER: With us in this country, we would not plant piece root trees. We have such bad luck. It seems to be impossible to get trees under six or seven years.

PROF. WAUGH: It would hardly be well to bring up that discussion to-day.

PRESIDENT KERR: I think there is a great deal of danger in it.

PROF. WAUGH: I will say a word more. While I realize that there is danger in bringing up the subject, I will express my own opinion. The method by which trees are propagated does not amount to anything. If I can get it one way as well as the other, it makes no difference. If the trees are delivered in good condition, I am satisfied. I would not have said anything further, but due to the fact that I was indirectly connected with an experiment a few years ago. Some people do not know whether whole roots are better or piece roots. In the horticultural department they undertook to make a test and a considerable orchard was tried out of both kinds, and I had the pleasure of laying out the ground and orchard. It has been shown there, by about fifteen years, that there is no difference in that orchard. I know of others that have come out that way. I am thoroughly convinced that it makes no difference. It is all with the nurseryman. What I want is good, heavy, sound trees, that come clean, bright and true to name with good tops and roots, and then I don't care.

MR. HARRISON: I am glad you brought up one point. Nurserymen are concerned with this point Our experience in planting apple grafts, shows that it is cheaper to grow from whole roots than piece roots. We get more first-class trees. We have planted for several seasons; but on our soil we have not been successful in planting piece roots. But with whole roots, making one graft and using a long graft, if possible, we could get just twice as many first-class trees. But if we take piece roots, it takes three years. It takes more labor and expense, and we have decided that it pays better to use whole root grafts rather than piece root grafts. I understand in the West they prefer the piece root. The planters in the western region of this State, and in West Virginia, and Virginia, prefer whole root trees. When a tree becomes fifteen or twenty years old, they claim, and strong wind blows, it will go over if on piece root, but with the whole root they stand longer. It is cheaper to grow whole root than piece root with us, to get first-class trees with fewer culls.

GROWING AND MARKETING PRODUCE IN ENGLAND.

RICHARD VINCENT, JR.

To me has been assigned the task of addressing you in regard to trucking and fruit growing as viewed by myself while traveling through England the past summer. To many this may seem an easy task, but I found it much more difficult than I supposed it would be for several reasons.

Among leading horticultural writers and go-ahead men, such as Mr. Harrison Dick, Mr. Brian Wynne and others of like intelligence and progress, were only too anxious to give and receive information and an opportunity to visit the Royal Experiment Grounds where every variety of fruit, vegetable and flower are thoroughly tested before the grower can get a certificate, so that he can offer it, and the purchaser can be assured of its qualities and not be defrauded as is often the case in our own land. Some such indorsement should be required of every new variety which is put on our own market. A visit to the Royal Horticultural Grounds under the auspices of Mr. H. Dick (a Member or Fellow as they are called) was a trip, or a day in a lifetime, with such a one to explain. There was every new variety planted and grown alongside of an old standard and its merits or demerits plainly pointed out.

My only regret was that for both our time was limited, and we parted after a day or two passed in this manner, with the hope of meeting again to resume where we left off.

But when you come down to the common every-day working farmer, gardener or fruit grower you get left. He is too conservative, he does not want to tell you anything, he knows it all and has not got any information to give away, for fear he might lose something (we have that kind here, too), but still through perseverance and use of my eyes I was able to see and judge of their mode of planting, working, etc.

Orchard Planting and Fruit Growing in General.

The fruit growing of England differs to a large extent from that of our own country, in the first place the growing of peaches is only limited, as they are only grown there under difficulties, apples and plums being their two leaders. These, according to the writer's views, are too closely planted or would be to suit our climate. Most all the orchards are planted in small fruits such as gooseberries and currants, of which enormous quantities are used, being grown and sold very cheap which puts them in reach of the masses where otherwise large numbers would not know the taste of fruit of any kind.

I believe that the prospect for a market is good for all of our orchard fruits, especially for our American apples as their reputation is good with the majority, and everyone speaks a good word for them, the only trouble is that inferior fruit from Southern Europe and elsewhere is offered under the American label, to the disadvantage of our brands, but we think that this will work itself out as the public is getting educated as to the quality and appearance of our fruit.

Not only that, but large quantities of our best brands of canned goods are to be seen exposed for sale in stores dealing in such articles, thus showing that our market is broadening and widening year by year with no danger of over-production if the markets in which we now have an opening are properly taken care of.

The whole of England might well be called a truck patch, for with the density of population you find truck patches everywhere wherever land is suitable or obtainable, much of this land is highly manured and worked close, one crop after another following as closely as it is possible to get the crop in.

Manuring.

Undoubtedly all the garden grounds around London are manured very heavily. I noticed that the wagons returning from Covent Garden and other markets of the metropolis, were heavily loaded with stable manure with their empties on the tailgate or top of load, also vast quantities are being carried by railroad wherever convenient. I also found quantities of nitrate of soda and other fertilizers of a highly nitrogeneous character being used, an application of one or the other being made whenever possible, as the high price of land either for the renter or owner, makes it very necessary, to get the best results as far as possible, some of them do undoubtedly make considerable money, as good truck brings reasonable prices and the market does not fluctuate as much as ours does.

In one district which we visited the land was enormously productive and made so by the use of sewerage which was piped to that section from the city mains, and then pumped up so that it is made available for the use of the trucker whenever he deems it necessary to saturate his land This is done by a yearly rental which, I understand, is much less than the man who uses manure could make his land in the same productive condition for. I wish that the sewerage from our own city of Baltimore could, every bit of it, be made as available instead of being let run into the rivers and harbors.

Cultivation and Labor.

A great deal more of their cultivating is done by hand than we do and less with the plow, spade and hoe. I found some good tools, but such things as wheel-hoes, etc., seem to be rare and far apart, a great many of them have large or Percheon horses and with the closeness that potatoes, cabbage, etc., are planted it would be impossible to cultivate unless smaller animals were used, as it is impossible for a large horse to walk in a narrow row.

I cannot understand why more progress is not made, but the average Briton is like some of our growers, it takes some hard knocks to get ideas into his head, of this I am firmly convinced after sundry conversations with some of them, and the same old style which their grandfathers followed is considered good enough for them. So, the man outside is with his quicker movements steadily getting into the market and taking his trade from him. When too late he will realize that he has let the golden opportunity slip past him forever.

I do not consider that they are as near up to date, by far, as our own fruit and truck growers are, and one good man who knows how to handle improved machinery for working and cultivating crops would do four times the amount done on the average, by the English farm laborer.

Tomato Growing near London and on the Channel Islands.

Some years ago it was by request my fortune or misfortune to deliver a short address before the Peninsula Horticultural Society in regards to the growing of vegetables under glass in our own country, and as to my view in regards to the profit of the same, in which I stated that it was being done with great success by the few who were putting their best abilities to it, and I still see no reason to withdraw that opinion.

At that time I did not think it would be my fortune to visit England and the Channel Islands looking to this industry as well as other matters tending to the cultivation of fruits, flowers and vegetables.

While in London I received an invitation to visit the large plant of the Rockefords. This is one of the largest of the many in the same locality, about fifteen miles by cars from one of London's central stations. These parties have nearly twenty acres of ground closely covered with glass. I found about twenty large houses used alone for forcing grapes. Mr. Rockeford seemed surprised when I stated that it would not pay us to force grapes and stated that they had packed and shipped a good many for U. S. A. in the last few years.

About one-third of all their houses were filled with tomatoes growing in large pots, none being planted in the ground. The houses were mostly of good height, and the tomato plants were trained and grown to a single stem. The growing and care appeared to be perfect. And from the appearance and look of Messrs. Rockeford's place there is very evidently some money in the business for them, tomatoes being their second crop or rather the summer crop, bulbs and other stuff being forced during the winter.

The growing of vegetables under glass in the Channel Islands for the English markets has reached an enormous extent. No longer does the cow, or rather, the dairy, hold sway. The dairymen have sold their cows, bought glass and other material suitable for greenhouse building, according to their ideas, and as a consequence, no matter where one gazes, there are seen glass houses filled at that time (July 15) with tomatoes; some with the main crop picked, but in a majority of cases the tomatoes were just in their prime.

According to my ideas their manner of building greenhouses is not up to date. They are behind the times to a certain extent. Their houses are much like those we built 35 or 40 years ago in this country, and not anything like we are building now. All their houses have too much lumber and are too heavily constructed, the bars are all plain, or to a great extent so, no grooved or drip bars like ours being used, a plain, rather weak bar being their model, therefore requiring more support against the wind storms, which they say would crush their houses if lighter. The rafters they use are very heavy, one about every six or eight feet, then two heavy purlins to each side, with a heavy crossbar extending across the house from rafter to rafter, which makes considerable shade. These houses vary in length from very short ones to 400 feet or more, and are in blocks of from two to twenty houses, with an average width of about thirty feet. A great many of them have strongly-built stone walls. Among them we found several very large lean-to houses, also built in the old style of half a century ago, now obsolete with us, the glass used being mostly 10 x 14 and 12 x 16 inches, single thickness, imbedded in putty, and zinc points being employed.

A great many of the growers there have no heat in their houses, while others have no water system, making considerable difference as to the time the crop or crops are sown, and a large number of them make the tomato a second or main crop. With some, cucumbers is the crop relied upon. The houses are planted or sown early with radishes, peas, potatoes, beets, cucumbers, etc., for the English markets, but tomatoes largely predominate over everything else.

The seed is sown early, and grown along in pots until the other crop is taken out; sometimes they are put in position before the other crop is entirely taken away, every other row or plant being removed. The tomato plants are mostly trained to single stems unless there is room for other limbs, when two or more limbs are used. These plants are staked or tied to wire overhead, most of the houses being built high enough to give each vine a length of seven or eight feet. Some growers do not plant out, but grow them in large pots. The tomatoes are planted twelve to eighteen inches apart in the rows, with a width of from two to three feet crossways, the pollenation is done by shaking the vines when dry, or the disbudding distributing it largely. The reason for growing in pots, adopted by some growers, is that they can control the growth better, both as to watering and the application of fertilizer, so that they do not get the rampant growth of vines, as when planting out in rich ground. And while it entails more work, it really, they claim, brings more money to pay for it.

The growers use a very strong compost for the crops grown previous to the tomatoes or cucumbers, spading the material in deeply, hence the objection, by some cultivators, that those planted in the ground get too much food at the start, making them long and rank. They would much prefer them not to grow so rank, but stimulate later on, as we found some of them doing with concentrated fertilizer.

We also found houses which had fruited out, being replaced with another crop that would come on for late fall or winter, this, and the very early crop would be the one that would be apt to interest our people to grow; the midsummer crop would not do so, as there would not be much in it when the same could be picked from the field. But such cucumbers as they raise we believe would find a good market with our people at all times.

Talking in regards to varieties with one grower who was growing one variety that originated on the Islands, he said it is rather inclined to grow crooked, but that some of them give more weight than smooth varieties. It seems as if quantity more than quality is what the majority are after. Yet some of the growers appear to be growing a good, smooth, satisfactory variety.

To estimate the enormous quantity of tomatoes grown on the Island of Guernsey, one needs only to stand on the wharf of a morning when they are shipping, as we stood there one Tuesday morning in the middle of July. There was a large number of wagons, each loaded to its utmost capacity, and two good-sized steamers were being loaded for the English market with the baskets of produce. The English railroads and steamers return all empties. The tomatoes are shipped from the Island in handle baskets holding about fourteen pounds each. Fruit the week previous had brought, on an average, 3½ cts. a pound, making it about $2.00 a bushel, according to our calculation. As labor is cheap there, when required, this leaves, after paying all shipping expense, commission, etc., a fair margin, even with the large growers who have to employ labor. In the smaller establishments the work is mostly done by the man himself, and his wife and children.

One person can attend to a good-sized establishment of this kind, and that some of them are making money was shown by my informant, who drove me around to various places, and the fine new homes that are being built since they abandoned the cow and put her price in glass houses were evidence enough that such was the case.

Covent Garden Market, London.

That Covent Garden market, London, is about the largest truck, fruit or vegetable market in the world no one would have any doubt if he would view it any morning, but more especially the three main market mornings, which are Tuesday, Thursday and Saturday. It was my pleasure to be there one of these mornings, and one of the off days also, I was there the off day first, and was much surprised at the quantity, but more so on one of the main days, when not only the market was closely crowded with wagons, but the streets around in every direction for a long distance were completely given up to this industry for the time being.

The market in its entirety is a monstrous affair, it is apparently as far as possible divided into distinct sections; one is a large building for flowers and plants, another for both foreign and domestic fruits, with tomatoes and fancy vegetables such as artichokes, cress, cauliflower, cucumbers, etc., interspersed, while the yards and streets are filled up with wagons loaded with peas, potatoes, cabbage, lettuce and other like articles from the surrounding truck gardens, and an immense quantity of different railroad company's wagons, or perhaps they might be called express wagons, delivering to different dealers and standing with it on the street until it was sold or disposed of. Some of these wagons had heavy loads on, but not anything like the loads brought in from adjacent territory. Some of these wagons I would like to be able to picture to you, not only as to the loads carried, but to show what a pair of horses can haul to market where an improved road system is in vogue. These wagons were large and with slatted sideboards three and a half feet high above the regular sides of the wagon, and when loaded to its full capacity with cabbage it looked like one of those large loads of hay we see come into our city by various roads every day. The sideboards fold up when the wagon is unloaded as the driver has to carry a load of manure back, this seems to be the rule without any exception. When other things are carried in baskets, etc., they are either stacked on the tailgate or on top of the load of manure, and it is a sight to see the size and height of even these returning wagons and the loads that they carry on their return trip; it certainly must require a strong hearty man to handle this end of the business.

As an American, possibly I look at things differently from what the average Englishman does. He may think he is up to date, but I must say I think he is a back number in a great many things, more particularly in his mode or manner of packing vegetables for market, It is true that lumber is rather dearer with them than with us, another thing with them, the railroad returns all empties to the grower; if they did not the grower would be left, as the majority of his stuff is sent to market in baskets of all sizes and shapes, and a good many are well made and of course costly.

Strawberries are sold in baskets holding about four quarts; peas, beans, potatoes, etc., in baskets holding from a half bushel to about three bushels, some peas in sacks and potatoes in half barrels; turnips, beets and other like vegetables are bunched and sent to market in hampers holding from three to five bushels. Taking it all in all, it is a mixture of all sizes. shapes and qualities, in which the British gardener sends his stuff to market. A great deal of the stuff is from other adjacent territories, especially from the south of France, and a good deal of this is in boxes, and appeared to me to be in much better packages than the home produce is put up in.

The markets of Edinburgh and Glasgow when we reached there in August were using our American boxes and crates for berries, in fact, I found the Glasgow wholesale market more like our own than any other that I struck, except that after a certain hour the commission man auctioned off whatever of fruit, vegetables or flowers he had left on hand.

There is, to a certain extent, a great difference in many kinds of vegetables grown and used, the moist, mild climate with no extreme heat or drought being favorable for growing some things perfect that we cannot. But we have some things that our hot, dry summer will bring to perfection which, if the people of England were educated up to taste, and use, they would gladly accept our surplus. One thing largely used there, and also in the northern cities of our country, and good money made of it, is water cress. There are many streams in our State that could be used for this, and other things of like nature, but I am afraid I have made this paper too long. I thank you for your patience.

THE PERSIMMON.

DR. E. P. MAGRUDER.

My attention has been recently directed to the possibilities of the persimmon. There is reason to believe that in the near future greater attention will be given to the cultivation of the native persimmon—*Diospyros Virginiana*—crosssed with the Japanese type, *Diospyros kaki.* The antiquated idea of earlier botanists that this fruit must needs be subjected to the action of frost before it is edible is a fallacy. Many of the best varicties ripen long before frost, while others are too astringent to become edible even after freezing.

The persimmon is readily propagated from native seed planted in the fall, like peach pits, and the seedling when two or three years old crossed with Japanese blood by budding or collar-grafting, 3-4 inches below ground, in the early spring when the bark slips easily. Great care must be taken to preserve the long tap-root when transplanted in the autumn, with well headed-back top.

The native persimmon at best attains but two inches in diameter, while the Japanese cross may weigh a pound. This gives us an idea, since the pure Japan will not thrive so far north as Maryland, what we may expect under favorable conditions from the hardier cross.

This fruit thrives best on a rich, warm soil, well exposed to sunlight and properly cultivated.

Some varieties grow rapidly tall, others assume the dwarf habit, and not uncommonly at three years of age yield several hundred perfect fruits. Round varieties ripen first, while those of oblong shape are last to ripen. The latter are the longest keepers. The flesh varies with the variety, from bright orange to dark, brownish-red color. The latter is edible when quite solid. The flavor is rich, sweet, like that of an apricot, or, at times, like that of custard. Its botanical name, *Diospyros*, or Jove's grain, has reference to its edible qualities. The dark-fleshed are never astringent; the light are so until they soften. The light-fleshed kinds are often seedless.

The best Japanese varieties, named in the order of ripening are: Yedoichi, Hiyakume, Yemon, Hachiya, Tanenashi and Costata. Best among our natives of distinct name are: Early Golden, Altan, Marion and Accamac.

The uncertainty of the market at present is due to adverse conditions. Shipped hard and ripened after reaching its destination, the fruit is often sold and eaten before it is properly ripened, and the great majority of the fruit-eating people of the north do not know what a delicious fruit we have in the fully ripe American-Japanese persimmon.

CANTALOUPE GROWING IN WASHINGTON COUNTY.

J. P. BLESSING.

The best soil is a sandy loam, preferably a sod. Turn down in the fall, dress with an application of 30 bushels of lime per acre, pulverize with a spring-tooth harrow at the earliest possible time in the spring. Check off each way with a two horse bar-shear plow 4½ feet each way. At each cross furrow make your hill, first drop a handful of fertilizer, rich in phosphoric acid and potash; mix well with the soil. Make the hills nearly level with the surrounding surface, so that afterward the cultivation will bring the hill up to the general level. Wait a week or until after a rain before planting the seed. Always soak the seed in tepid water for two days before planting, they germinate better and quicker. Now drop 8 to 12 seeds on top of the prepared hill and cover with a shovel one inch or little less with fine soil. As soon as the planting is finished, level the ground by going over between each row both ways with a wide cultivator. As soon as the plants are fairly up, go over the rows with good hoes, and reset missing hills with plants from the hills having too many, first chop a place in the missing hill well under the plants and transfer them with the soil to the missing hill, by this means the plants will not even wilt, and you have them uniform in size; besides it is done as quick as replanting the seed. From this time on eternal vigilance is a pre-requisite to success. Cut worms, little black hoppers like fleas, aphis, etc., will be on hand in numbers to try your patience and your fighting capacity. For cut worms, wheat bran mixed with molasses and Paris green, placed near the hills has proved effective. For insects that feed on the top of the plants, air-slacked lime mixed with kerosene oil, a gill of oil to two gallons of lime, dusted on the plants has been found beneficial. For aphis, which feed on the under side of the leaves, fumigation with bi-sulphide of carbon for 20 minutes will effectually rid the plants of all insects.

Keep the hills scrupulously clean of weeds and grass, and the ground mellow about the plants until they begin to run. About this time begin spraying to prevent blight. I use 3 pounds of sulphate of copper and 6 pounds of lime to 50 gallons of water, sprayed through the smallest Vermorel nozzle, and applied every ten days. On account of frequent rains, the past year I sprayed four times. Stop spraying when the first melons begin to ripen. Now go over your melons every day and pick all that show a crack or particle of sap around the stem, so they can be pressed off with the thumb without breaking the stem. Select carefully, pack all large perfect melons 45 to the crate, these mark fancy, the next selection mark choice, and the third selection mark culls. Never pack over ripe or imperfect ones. I also mark on my crate "guaranteed sweet," when I know them to be so, but as soon as they begin to lose flavor I omit the guarantee.

Question Box Discussions.

What can be done for scab on white potatoes?

F. H. **Blodgett**: The best thing so far for the scab of Irish potato seems to be to dip the seed potatoes in corrosive sublimate. The percentage I cannot at this moment state, but it amounts to about a one-tenth per cent solution, and afterwards planting them as usual.* In New Jersey they have performed a number of experiments in regard to scab of Irish potatoes and rot of sweet potatoes, using flour of sulphur, rolling the seed in the sulphur previous to planting, and planting or spreading a handful of the sulphur in the hole when planting out. In those experiments, the presence of the sulphur not only checked the scab or rot, but added a great deal to the smoothness of the potato. In some of the experiments performed in New York, soil treatments were undertaken, to determine whether the effects of applying any green manure would be preventive or beneficial, as correcting the influence or injury due to the scab. The results were entirely negative. It has been found, however, that the results obtained in New Jersey do not hold in all other places, largely due to the difference in soil, the New Jersey soil being of the red shale character. So far as I know, there has been no material benefit due to soil culture, as a check for scab. It is important not to use the same soil repeatedly for any crop especially after a disease has become seriously abundant on that crop.

There may be some farmers here who grow potatoes extensively and who can give their experience with any particular form of treatment. I would be very glad to hear from some of them.

Stable manure is very apt to foster the effect of the scab, especially if scabby potatoes have been fed raw to animals, whose manure you are spreading on the field. The potato scab germ will live after passing through the digestive tracts of beef and other animals, and when such manure is spread on the field, the germs will not only be scattered over the field, but have a more or less nourishing medium in which they can thrive. The scab fungus attacks beets also.

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*The corrosive sublimate solution recommended is 2½ oz. corrosive sublimate dissolved in 2 gallons hot water, diluted after 12 hours to 15 gallons (sufficient for 20 bushels of seed). Label "POISON," and keep accordingly. To use, have the poison solution in a barrel, and place the whole potatoes in a sack, previously washed to remove dirt, and soak in the liquid for an hour and a half, then remove, spread out to dry, cut and plant. Formalin solution may be used also, and is less dangerous as a poison. Use 8 fluid ounces commercial formalin to 15 gallons water. Use as before.

Sweet potato rot is largely controlled by the use of sulphur. That is, scattering sulphur at the rate of 300 pounds to the acre in the rows when the plants are set out. Lime also is beneficial to control the rot.

A MEMBER: Will crimson clover have any effect?

MR. BLODGETT: I should prefer not to use it. The decaying vegetable matter in the soil will foster any bacteria that might later on affect the potato.

MR. BROWN: Do you know of anyone who has tried coal ashes?

MR. BLODGETT: I do not.

MR. HARTSHORN: Do you know the results of the Rhode Island Experiment Station?

MR. BLODGETT: The Rhode Island soils are more acid than the New Jersey, and the same treatments were therefore different in effect. I do not at this moment recall them.

Will buds or grafts taken from nursery trees, or trees that have not fruited, give as good results as those taken from trees that have produced fruit. providing the trees are in a healthy state?

PROF. C. F. AUSTIN: It seems to me that Brother Kerr could answer that question better than anyone else. It is probably true that the majority of nurserymen take their buds from trees that have not fruited, but there is no doubt that with trees that have not fruited, it would be the best thing to do.

MR. BALDERSTON: It is impracticable to get buds for general propagation from bearing trees, and in the case of peach especially, it is almost impossible. You find nine double or blossom buds for one that will grow properly and produce wood instead of bloom. When the flowers open on the inserted bud, it is at the expense of the vitality of the central leaf bud, and there is a greater or less failure to start; and in the case of new or scarce varieties we are compelled to use these scions.

MR. HARRISON: If peach buds could be secured from bearing trees that were free from disease, that had sufficient growth to get good buds and the tree should be some improvement of that given variety, it would be well to bud from growing trees, in fact, it is a good policy to bud from bearing trees every few years, anyway, yet you will not get as many buds to grow from bearing trees as if the buds were taken from the nursery row where the trees are younger and more thrifty. You seldom get more than 50 per cent of the buds to grow from orchard buds. We try to start all of our varieties from bearing trees or from the originator's stock.

What are the three best blackberries for succession?

MR. DAVIS: I don't grow but one blackberry and that is the Lucretia dewberry. It is good enough for anybody.

PRESIDENT KERR: Perhaps Mr. Brown of Delaware can tell us something.

MR. BROWN: I don't know, sir. We are growing the Lucretia dewberry. It has been the main crop. From experience I can't say anything about it.

MR. DAVIS: On this Peninsula, you can't grow any other, where we ship and come in competition with New Jersey. They grow the Wilson's Early, and it comes in after the Lucretia has given us three-fourths to seven-eighths of its crop.

PRESIDENT KERR: If there is any gentleman here who can assist our friend in this particular, I wish he would speak up. It is proper for this Society to hear and entertain this question.

DR. VON HERFF: I would recommend the Austin Blackberry as the earliest; it is a very excellent berry, fine in appearance and productive. Its drawback consists in the fact that it is rather soft for shipping. The next in order is the Lucretia dewberry, which is a good, large berry and ships well. It is also not so liable to produce double bloom as other varieties. The third in order is the Wilson blackberry, which is prolific, of good quality and ships well. The plants, however, are liable to produce double bloom which can be avoided by cutting the canes to the ground soon after harvesting. The most profitable of the three from a market point of view is the Lucretia dewberry.

H. L. SHIPLEY: I have had a great deal of experience in shipping berries and peaches. Mr. Brown, of Wyoming can substantiate this fact.

The three best blackberries grown, the best shippers and the most profitable are The Lucretia dewberries which, if cultivated properly, are the earliest and largest, they run on the ground and must be trained to stakes to keep them out of the dirt as when cultivated, the rains beat sand upon them. They are very prolific and yield large crops and when picked close, make a fine berry for shipping. The Harvest is a long small berry and comes in about a week or ten days after the Lucretia and continues to pick until no one wants any more, they sell in the west and north better than any other variety and are always sought after. The Wilson comes next about ten days afterwards, they are very fine shippers and sell best in the eastern markets, they also live as long as wanted.

What are the three best raspberries for succession?

Mr. Geo. O. Brown: I suggest that we refer to a seed catalogue.

H. L. Shipley: As to raspberries I ship a great many, but varieties have changed so much that I have not been able to keep up with them to give much information.

The first raspberry that comes into market is the Souhegan, a black raspberry which comes in before strawberries are finished; they are small but very prolific; they pick very quick and are soon over. The Kansas is larger and ripens nearly as early as the Souhegan; they are very prolific and very fine for any purpose. The Gregg is the latest and comes in after the two former varieties are over; they are very large and very salable. The Miller is a very fine red raspberry, is the earliest and is more prolific than the Brandywine. The Brandywine is the best red raspberry for shipping but gets very much winter killed and is not so prolific.

If soil contains sufficient potash, but is deficient in lime and phosphoric acid, can the best results be had by supplying the lime and phosphoric acid only?

Dr. von Herff: Certainly, phosphoric acid must be supplied if it is needed and lime also must be given in case the soil requires it.

President Silvester: Does the Doctor mean to say that soil, which contains sufficient potash, but is deficient in phosphoric acid and lime, will be in an ideal condition for plant growth with these deficient elements of plant food supplied? Would not the physical condition of the soil have to be considered before a definite and correct reply could be given to the query?

Dr. von Herff: Outside of phosphoric acid and lime, potash needs to be supplied, and nitrogen also, as these elements constitute complete plant food, and, besides, the physical condition of the soil must be such that the fertilizers can act. If, for example, the soil be too hard and stiff for plant growth to exist, any amount of fertilizer supplied would not remedy the evil. A sufficient water supply as well as drainage and proper cultivation are also essential to make plant food, commonly called "fertilizers," fully effective. Fertilizers act best on soils which are in perfect physical condition.

Can blight be communicated to vines from the seed grown on blighted vines?

Prof. Norton: I don't know what plants the gentleman refers to. It might be either tomatoes or cantaloupes. There has been some question raised as to whether the cantaloupe blight could be communicated in that way. I do not think there is as much probability that the cantaloupe blight is communicated in such a manner, as with the tomato blight. It seems certain that the bacterial tomato blight can be communicated and is communicated through the seed. The seed should be selected well or come from a country where the southern blight is not found. I do not believe that the cantaloupe blight is communicated through the seed, but I know of no experiments to show whether it is or not. I would like to hear from any one who has had some experience along that line.

Mr. Blessing: Could you recommend any treatment for such blight.

Prof. Norton: I could not. In case of cantaloupe blight, if spores are attached to the seeds, it could possibly be treated with formalin or such chemicals.

President Silvester: I would like to ask is not there a method of treatment of the tomato plant after put in bed.

Prof. Norton: Not if it is affected with bacterial blight, but for the common leaf blight they can be sprayed or dipped in Bordeaux mixture, which would stop most of it. Bacterial blight could hardly be treated. We must depend on blight-free land or resistant varieties.

The unsatisfactory character and scarcity of labor on the farm—what are we going to do about it?

Mr. Harrison: We had quite a little difficulty this past season in that line. We went South to the industrial agencies and ordered them in bunches of ten. While we did not get all good help, we got as large a per cent of good men and women as we could have gotten from our own section. We had them delivered from Richmond, Va., at $7.00 a piece, and they signed a contract to refund this money to us from their wages. We found it rather satisfactory. Some got their trip and got back, but they did not all leave before paying us. They helped us out of the difficulty very much. I don't know of any better way we could have secured help promptly. We got two or three bunches about the 15th of April. There were two colored women among them, and they made good help and are not running about like those near home usually do.

What is the general opinion concerning the advisability of putting chloride of potash and sulphate of potash in the same fertilizer mixture? Isn't there an interchange of acid and basis forming ammonium chloride, which some stations have found detrimental to plant growth?

Dr. von Herff: Chloride of potash can be used together with sulphate of potash without producing any harm, except that chlorine is added to the mixture, and where chlorine is not wanted, it is better to use sulphate of potash only. This is important in the growing of smoking tobacco, since it has been experienced that sulphate of potash produces a fine quality of leaf with good burning properties, while if the potash be in the form of chloride, the quality of the weed is lowered. For most crops, however, chloride of potash is beneficial without harmful effect on quality. It appears not advisable, however, to mix sulphate of potash with chloride of potash under any circumstances, simply for reason of economy.

What is further known about the bottled-up fertility or nitrogen bacteria, which the Bureau of Plant Industry at Washington has been writing about? Can it be used successfully in growing vegetables, such as cabbage, spinach, kale, etc., on rich or fertile soil instead of manure or other fertilizers? What soil is recommended for its use and how should it be used on corn, wheat, tobacco and potatoes?

M. B. WAITE: Mr. Chairman, I will try to answer them one at a time. (1) There are two ypes of soil bacteria that are under investigation by the office of the Plant Physiologist and Pathologist of the Bureau of Plant Industry. The one type is the well-known type of germs, which produce the root tubercles on leguminous plants. These root tubercles are caused by a little germ, a species of bacteria which is parasitic in a way on the root of the clover, and produces the little tubercles over the roots the size of the head of a pin, and the parasite lives in the root tubercles; but while situated in the root tubercle it is able to use the nitrogen in the air, and these little germs have the power of combining that nitrogen with other material and making plant food. They behave in a peculiar way and assimilate more than they need. The plant has the capacity in the green matter of its leaves of combining the carbonic acid gas with water and making sugar, starch and those compounds. While the plant can make all the sugar it wants, the tubercles will make the nitrogen compounds and they work together beautifully. The germ gets the sugar from the plant and it is found that all soils do not have the germs to produce these tubercles, but they can be placed there artificially. They may be applied to that soil. It must not be understood, however, that the placing of these necessary elements in the soils takes the place of other matters as manure. They will merely give you the opportunity of placing these living germs, which naturally belong to fertile garden soil. Dr. Moore of the Bureau has made splendid progress in the cultivation of these germs and he has arranged so as to cultivate them rapidly and most virulent in type. He can saturate cotton with germs and mail to growers, who mix with sugar water in a barrel and in a day or two have a large culture of these germs. You can then dip your seed or sprinkle it on. That would produce no effect if the germs were already there, but if absent, it would make a very marked effect. I tried it with soja beans, a Japanese plant, and a member of our department imported some soja bean soil and I sowed it in the drills with the seed, and got a much larger growth in a small plat than on the check plan on newly cleared pine land. The relation of the plats was as eight to fourteen.

The other type of germ I am hardly prepared to discuss this matter, as it is so new, and I think I can say this much—that it has been found in recent years, especially by one investigator, that fertile soil contains germs which have the power of absorbing the nitrogen without the tubercles. This is the new phase of this matter. There are probably other plants besides the leguminosae which aid to absorb nitrogen. We now know that there are in the soil germs which have that power, and Dr. Moore is in Europe and has been spending the summer in studying with Professor Winogradski to bring back the very latest and best results, and the germs themselves. So we may hope for some future development along that line.

The second question. Now, of course, the root tubercle germs from leguminous plants cannot be used on cabbage, kale, etc. These other germs might be used to build up the soil. To answer that question literally, I should say no, and they are not likely to be necessary. It would take a very careful investigation, and, as I said once before, they would not compete with manure or artificial fertilizers.

Question No. 3 is along the same line. We would not expect to use the root tubercle germs on corn, wheat, tobacco and potatoes, and we can only use the other on poor soils, which need replenishing in their biological elements.

Reports of Select Committees.

ON FORESTRY BILL.

J. P. BLESSING, F. RAMSDELL, DR. E. P. MAGRUDER.

Your committee, to whom was referred the draft of an act for the creation of a State Forestry Commission, have read and considered the provisions therein, and we recommend the adoption of the same, as well worthy of the endorsement of this Society.

We further recommend an additional clause inserted in the bill for the protection of our forests against forest fires. In Pennsylvania they have a law which makes every constable a fire marshal or sergeant, whose duty it is to call out citizens for the suppression of fires and whose compensation is fifteen cents per hour for the work. The report lacks the signature of one member of the Committee, but he authorized the signing of it.

An Act for the Creation of a State Forestry Commission and defining the Powers and Duties of the Same.

Be it enacted by the Senate and the House of Delegates of the State of Maryland.

That in consideration of the public benefit to be derived from the planting and preservation of Forest and Timber trees in the State of Maryland and to promote and protect the same, there shall be appointed a State Forestry Commission, to be constituted as follows:

One Commissioner of Forestry to be appointed by the Governor, who may employ a deputy and Secretary and maintain an office for the transaction of the business of the said Forestry Commission.

This Commissioner and his deputy shall select four citizens of the State of Maryland that they shall recommend to the Governor for appointment as consulting and advisory members of the Board of Forestry Commissioners.

Two of these shall serve a period of four years, and two for a period of two years and thereafter shall be appointed for periods of four years. These consulting members shall receive no salary, but their traveling expenses and all other expenses incident to their duties and when attending meetings of the Board shall be paid upon warrants drawn by the Secretary and countersigned by the President of the Board.

The State Forestry Commission shall make surveys of the lands of this State now clothed with native forest and especially such as are now owned by the State of Maryland with the view of determining what may be done for the same to protect the native growth and to increase its commercial value.

They shall examine and report upon the possibilities of maintaining a growth of timber upon the lands and about the head waters of such streams as now supply our chief cities and towns with water, to assist in protecting the same from pollution and from the effects of heavy floods.

They shall recommend such additional legislation as may be needed to prevent the kindling or spread of forest fires and the consequent destruction of seedling and other growing timber.

They shall examine and make report upon the effect of forest growth upon rainfall and its effect in preventing drought, so far as reliable statistics can be obtained.

They shall have full power by and with the consent of the Governor to purchase any lands in this State suitable for timber or that is desirable to maintain as forest for any cause whatever, provided they shall not be required to pay more than five dollars per acre for any such land, unless in special cases such purchase may be recommended by the State Board of Health for sanitary reasons.

They may purchase lands sold for taxes when the same shall be in tracts of not less than one hundred acres in extent, when in their judgment it is desirable to do so to add to the forest preserve of the State.

They shall have full control of all lands so acquired, whose title shall be vested in the State, as well as what may be now held that is adapted to forestry.

They shall provide for the care of the same and prescribe regulations for the sale of marketable timber that may be growing thereon, as well as for the removal of all worthless growth that may be desirable.

They shall also have control of all such mineral land owned or acquired by the State and may lease the right to mine on these lands and shall see that the timber growing upon it is protected as far as practicable.

The Commissioner of Forestry shall be the President and Executive officer of the Forestry Reservation Commission and General Superintendent of all lands owned or to be acquired for the purpose of forestry in this State.

He shall make an annual report of the operations of his office and the condition of such lands as may from time to time come under his direction.

The Commissioner of Forestry shall receive a salary of two thousand dollars a year and all necessary expenses for travel, clerical assistance and other incidental expenses incurred in the performance of his duties, which shall be paid out of the State Treasury from any moneys not otherwise appropriated.

All moneys received from him from the sale of timber or other sources shall be paid into the State Treasury.

He shall give bond for five thousand dollars, to be approved by the Governor for the faithful performance of all the duties of his office.

Be it further enacted for the aid and encouragement of private land owners in the State of Maryland, and the future benefit to the people of this State and of the United States, from preserving a due share of the land in growing timber.

That the owner or owners of any land in the several counties of this State, planted with valuable timber trees, in number not less than one thousand to the acre, shall, upon satisfactory proof thereof, be entitled to receive from the County Commissioners of their respective counties, after the same shall have been planted and maintained in good growing condition for one year and during a period of ten years thereafter a rebate of taxes equal to ninety per cent of all that has been levied upon the same during the year immediately preceding.

And further, the owner or owners shall be entitled to receive a rebate of fifty per cent of taxes for an additional ten years, from the rate then paid upon other adjacent lands.

Provided, that it shall be lawful for the owner of said land after the period of ten years to reduce the number of trees that may be then growing thereon to not less than six hundred per acre, but no part of the same shall be actually cleared.

The provisions of this Act shall apply to all lands that shall have been recently cleared of forest, when the same shall have been protected for one year by a substantial fence, or otherwise, from the browsing of cattle or sheep, that the natural growth of timber may be reproduced by self seedling or sprout growth, but these provisions shall not apply to tracts of less than ten acres of growing woodland in contiguous territory.

All land claiming a rebate of taxes under this Act that they may be stocked with timber trees, shall first be cleared of all mature growth, and of all dead or other timber that has no merchantable value, but which will prevent any uniform or healthy growth of young trees so far as their influence extends.

For the suppression of forest fires in the State it is hereby enacted and made the duties of all constables in the several counties thereof, to act as fire wardens in the suppression and extinction of any fires that may be started from any cause in standing timber, clearings or land contiguous thereto, that may run over land and destroy the seedling and other young trees thereon.

The constable in the performance of these duties shall be entitled to receive a compensation of twenty-five cents per hour while so employed and to have authority to call upon other persons to assist him in this necessary work, and all such

assistants shall be entitled to a compensation of fifteen cents per hour while working under his orders. He shall be paid for these services in the same manner as now provided by law for his other duties.

The item forest fires as here used shall not apply to fires where less than twenty-five acres of timber may be involved, or to clearings under the direction of the owner

The kindling of any fires in any manner by which damage may thus result to the property shall be considered and may be punished as a misdemeanor by fine or imprisonment or both; upon complaint before any justice of the peace; no fines to be less than ten dollars and costs or imprisonment not less than sixty days.

This Act shall take effect from the date of its passage.

AUDITING TREASURER'S ACCOUNTS.

CHAS. G. BIGGS, GEORGE BALDERSTON, C. M. PETERS.

Mr. President and Gentlemen: Your committee has carefully examined the books and vouchers of the treasurer. We find that at the beginning of the year there was a balance to the credit of the Society of $107.84. During the year we had the services of two treasurers, Professors Quaintance and Norton. The expenditures by Professor Quaintance were $392.64 and by Professor Norton $663.86, aggregating for the entire year $1,056.50. There are on file good and sufficient vouchers supporting the total amount expended. The balance in the treasury is $51.34.

EXHIBITS.

T. B. SYMONS, F. C. BISHOP, G. HINES THOMAS, COMMITTEE.

Your committee on exhibits beg leave to report the following: That while the exhibit of fruits was not extensive, due to the fact that the exhibitors did not wish to disturb the fruit in cold storage for the St. Louis Exposition, the different kinds of fruits shown were in excellent condition. The exhibit of wax fruits, vegetables and that of nuts was exceedingly creditable; also that of fruit trees, spraying apparatus, etc. Below will be found a summary of the exhibits with the names of the exhibitors.

FRUITS.

1. *Geo. Balderston, Colora, Md.* Apples: Ben Davis, Jersey Black, Lankford, Summer Parmain, 2 varieties unknown. Pears: Vicar.
2. *W. J. Miller, Joppa, Md.* Apples: Unnamed variety.
3. *H. W. Leasure, Cumberland, Md.* Apples: R. I. Greening, Lawver.
4. *A. L. Towson, Smithsburg, Md.* Peaches and Pears in solution.
5. *S. S. Stouffer, Sharpsburg, Md.* Apples: Jonathan, Stark,

Baldwin, Domine, Tompkins King, Roxberry Russet, Pewaukee, Rome Beauty, Lankford, R. I. Greening, Fallawater, Grimes Golden, Northern Spy, York Imperial, Albemarle Pippin and three other varieties.

6. *C. L. Vail, Forest Hill, Md.* Apples: Domine, Ben Davis, Roman Stem, Grimes Golden, Rambo, unnamed variety.

7. *W. E. Read, Dickeyville, Md.* Apples: Newtown, L. I. Russet, Lankford, Black Twig, Vandiver, Ben Davis, and two unnamed varieties.

8. *Caleb Long, Boonsboro, Md.* Peaches in solution.

9. *Shafer Bros., Boonsboro, Md.* Peaches in solution.

10. *W. Whike, Greenmount, Md.* Apples and pears in solution.

11. *Henry Fuss, Union Bridge, Md.* Apples: Missouri Pippin.

12. *F. E. Matthews, Pocomoke City, Md.* Pears: Kieffer.

13. *W. R. Hoopes, Bynum, Md.* Apples: York Imperial.

14. *J. P. Blessing, Brownsville, Md.* Apples: Grimes Golden, Russet. Pear: Japan Golden.

15. *Md. Experiment Station.* Apples: Kinnard's Choice, Smokehouse and others.

16. *Chas. W. Lake, Baltimore, Md.* Models of various fruits.

NUTS.

1. *J. W. Kerr, Denton, Md.* Chestnuts: American, Paragon, Dr. Black, Biddle, Kerr, Horace, Ridgely, Nunbo, Paragon, Col. Martin. Hickory Nuts: Shellbark No. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12, Shellbark extra early. Walnuts: Imparatrice, Thin Shell, White Kernell, Lyford No. 1, 2, 3 and 4; English, Persian and Japan. Hazel—Merville de Bollivuler, Geosee Tongue, Pour presse, Garabaldi Imperial, Kentish Cob, English, Prolipique a coque serrie, Grosse Ronde de Brunswick.

VEGETABLES AND COVER CROPS.

1. *Peter Lippold, Cumberland, Md.* Lettuce.

2. *J. S. Lapham, Greensboro, Md.* Sweet potatoes and 2 lots of Crimson and Alsike Clover.

3. *A. L. Towson, Smithsburg, Md.* Radish.

4. *Maryland Experiment Station, College Park, Md.* Tomatoes, crimson clover, Alsike clover, spring vetch, alfalfa, soy bean, rye; Seeds: Soy bean, vetch, crimson clover, hairy vetch, Alsike clover, black cow pea, black eye pea, cow horn turnip, rye, winter oats, spring vetch, spring oats, red clover, alfalfa; photographs showing numerous crops growing in Maryland.

5. *A. J. Tarbet, Baltimore, Md.* Celery.

NURSERY STOCK.

1. *J. G. Harrison & Sons, Berlin, Md.* Apple, peach, pear, California privet.

SPRAYING APPARATUS.

1. *Griffith & Turner, Baltimore, Md.* Pumps, hose, nozzles, steam cookers, etc.

INSECTS AND PLANT DISEASES.

State Horticultural Department. 36 cases showing the various insects that attack the different crops. 25 cases showing the different fungi that attack the different plants and fruits.

AWARDS.

A. N. BROWN, C. M. PETERS, RICHARD VINCENT, JR., COMMITTEE.

Mr. President, Ladies and Gentlemen: Your committee on awards respectfully report that we have examined the fruits and other exhibits and find them worthy of the careful attention of the members of the Society.

The exhibit of the Maryland Experiment Station is particularly interesting and instructive. The State Horticultural Department makes an elaborate exhibit of insects, plant diseases and remedies, worthy of honorable mention by your committee.

Boxes of soiling crops, the clover, vetchs and cow peas, and the photographs of these crops taken from Maryland farms, are of value as demonstrating the possibilities along these lines, and therefore deserving of special mention.

Your worthy President, Hon. J. W. Kerr, exhibits 40 varieties of nuts, to which we also call special attention, and recommend a certificate of merit be issued to Mr. Kerr for this most excellent exhibit. The exhibit comprises 11 varieties of chestnuts, 12 hickory nuts, 6 black walnuts and 11 filberts.

J. G. Harrison & Sons, of Berlin, Md., are entitled to honorable mention for their most excellent exhibit of nursery stock; clean, healthy, vigorous, well-grown trees, free from insects, and fungous diseases.

Griffith & Turner Co., of Baltimore City, exhibit a creditable line of spraying machinery and seeds.

Charles W. Lake, of Baltimore, exhibits a collection of finely modeled fruit and vegetables, deserving more than ordinary mention.

In the Vegetable Department your committee announce the following awards:

Best Lettuce—Peter Lippold, Cumberland.

Big Stem Jersey Sweet Potato grown from Slip-seed—J. S. Lapham.

Tomatoes—Maryland Experiment Station.

Radish—A. L. Towson, Smithsburg.

Celery—A. J. Tarbet, Baltimore.

In the fruit department we find some excellent specimens: Samuel Stouffer leads with 14 varieties to whom your committee awards first prize for best collection of perfect fruits, the varieties are Domine, Grimes Golden, Nickajack, Fallawater, York Imperial, Baldwin, Roxbury Russet, Pewaukee, King, Stark, R. I. Greening, Northern Spy, Rome Beauty, Golden Russet.

To W. E. Read we have awarded prizes upon 7 varieties as follows: Newtown, Lankford, Arkansas Black, Ewalt, L. I. Russet, Bellflower and Grindstone.

Mr. C. L. Vail. First prize on 5 varieties, viz: York Stripe, Ben Davis, Rales Genet, Wolf River and Roman Stem.

Maryland Experiment Station. First prize on two varieties, viz: Kinnard's Choice and Smokehouse.

Geo. Balderston. First prize on Cannon Parmain, also on Vicar Pear.

J. P. Blessing. First prize on Japan Golden Pear.

Your committee desires to call special attention to two plates of Ben Davis, one of Jonathan and two plates of York Imperial, as being perfect fruits, and exemplifying our possibility, and the result, when our ideals are reached. The exhibit as a whole is worthy, but is hardly representative of what such an exhibit should have been for a State so resourceful for orcharding and market gardening; if members could but realize that their exhibits are an ocular demonstration of the energy and progress of her citizens engaged in the pursuit of horticulture. More interest should be manifested in such exhibitions. Your committee commend the present effort and urge upon members of the Society the importance of greater efforts for the future.

NOMINATIONS.

DR. E. P. MAGRUDER, CHAS. E. SEYBOLD, E. P. COHILL, COMMITTEE

Your committee on nominations beg leave to nominate as President of this Association, Mr. A. L. Towson, of Washington County; as Vice-President, Mr. W. F. Allen, of Wicomico County; as Secretary-

Treasurer, Prof. J. B. S. Norton, of the Maryland Agricultural College.

Also the following County Vice-Presidents: Allegany, Mr. Frank B. Reid, Cumberland; Anne Arundel, Mr. J. S. Linthicum, Wellhams; Baltimore, Mr. Richard Vincent, Jr., White Marsh; Caroline, Mr. Jerome A. Davis, Greensboro; Calvert, Mr. Frank O. Smith, Dunkirk; Cecil, Mr. Geo. Balderston, Colora; Charles, Mr. W. W. Cobey, Grayton; Carroll, Mr. Jesse Smith, Union Bridge; Dorchester, Mr. W. G. Dawson, Cambridge; Frederick, Mr. S. M. Birely, Frederick; Garrett, Mr. W. McCulloh Brown, Oakland; Howard, Col. W. S. Powell, Annapolis Junction; Harford, Mr. Louis Hollingsworth, Forest Hill; Kent, Mr. Frank P. Cochran, Galena. Montgomery, Mr. Asa M. Stabler, Spencerville; Prince George's, Dr. E. P. Magruder, Glendale; Queen Anne, Mr. W. Irving Walker, Millington; St. Mary's, Mr. Jesse Turner, Laurel Grove; Somerset, Mr. F. E. Matthews, Pocomoke; Talbot, Dr. Chas. Lowndes, Easton; Worcester, Mr. Orlando Harrison, Berlin; Wicomico, Mr. Jefferson Stayton, Salisbury; Washington, Mr. E. P. Cohill, Hancock.

RESOLUTIONS.

H. R. FUSS, C. R. HARTSHORN, E. A. SEIDEWITZ, COMMITTEE.

The Committee on Resolutions presents the following report:

Whereas, The railroad and steamboat companies did promptly and cheerfully grant special rates to our members attending this meeting; and

Whereas, The Baltimore press and also the press of the counties of the State have given full and correct reports of our program and of the proceedings of our meeting; and

Whereas, The Baltimore Refrigerating and Heating Co., of Baltimore City, has given us free use of its plant for keeping fruits to be exhibited here at this time, thereby making possible such a grand display of fruits grown upon the soil of our State, and

Whereas, Mr. Chas. E. Seybold has so tastefully decorated our meeting place by the loan of decorative plants from the city conservatories at Patterson Park, and

Whereas, The exhibitors of fruit and vegetables and implements have added greatly to the instruction of the members, and

Whereas, The essayists of this meeting have shown much care in the preparation of their papers, which have proven so instructive and beneficial to the members of this Society;

Be it resolved, That the sincere thanks of this, the Maryland State

Horticultural Society, are due each and every one of the above, and that our Secretary be instructed to suitably express to them our thanks, and assure them of our deep appreciation.

Whereas, The members of the Maryland State Horticultural Society in meeting assembled in Baltimore on this date feel themselves edified by the masterful addresses of Dr. H. J. Webber of the Department of Agriculture of Washington, D. C., and Prof. F. A. Waugh of the Agricultural College of Massachusetts, and

Whereas, We wish to express our appreciation of the importance of these addresses in the development of the horticultural interest of Maryland;

Therefore be it resolved, First, that this Society extend to Dr. Webber and Prof. Waugh our hearty thanks for the encouragement of their presence and the instruction with which their able addresses abound.

Second, that we commend to all interested in the horticultural development of our native State and particularly to the members of this Society a careful consideration and study of the basic principles of their profession so entertainingly and ably discussed in these addresses.

Third, that the Secretary of this meeting be directed to spread this Resolution upon the proceedings of the meeting and that a copy of the same be sent to each of the lecturers.

Whereas, The members of the State Horticultural Society miss among its valued members at its annual meeting held in Baltimore on the 14th and 15th of January, 1904, Captain Robert S. Emory and James S. Harris, and

Whereas, We have heard that the occasion of the absence of Captain Emory is due to an attack of sickness;

Therefore be it resolved, That the members of the State Horticultural Society in meeting assembled extend to him their sincere sympathy in his indisposition and wish for him a speedy recovery to robust health; and

Resolved, That we feel keenly the loss of the sound judgment the convivial spirits and the ardent enthusiasm of each of our absent ex-presidents in the cause for which our Society stands.

Resolved, That this resolution be recorded among the proceedings of this meeting and that the Secretary be directed to send copies of this resolution to Captain Emory and Mr. Harris.

THIS BOOK IS DUE ON THE LAST DATE
STAMPED BELOW

AN INITIAL FINE OF 25 CENTS

WILL BE ASSESSED FOR FAILURE TO RETURN THIS BOOK ON THE DATE DUE. THE PENALTY WILL INCREASE TO 50 CENTS ON THE FOURTH DAY AND TO $1.00 ON THE SEVENTH DAY OVERDUE.

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